GAS JOURNAL

LIGHT ✦ HEAT ✦ POWER ✦ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXC. No. 3491.] LONDON, APRIL 16, 1930. [82ND YEAR. PRICE 1s.

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The Rotary Steam Meter is recommended for measuring the steam supply to Vertical Retorts. For Water Gas Plants, the Nozzle Type Recorder is recommended.

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For measuring the air supply to Purifiers, the **Balanced Recorder** is most suitable, a diagrammatic record is given of the rate of discharge.

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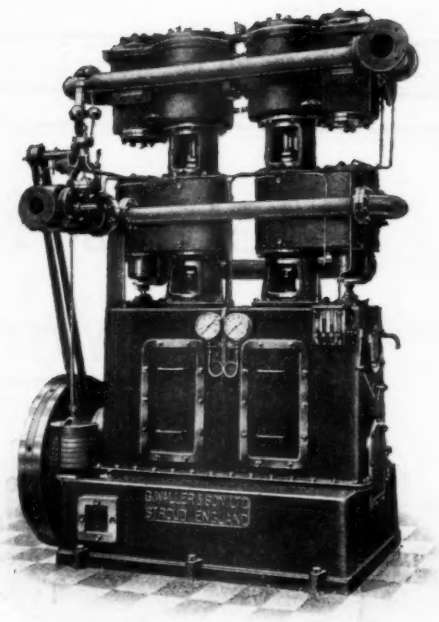

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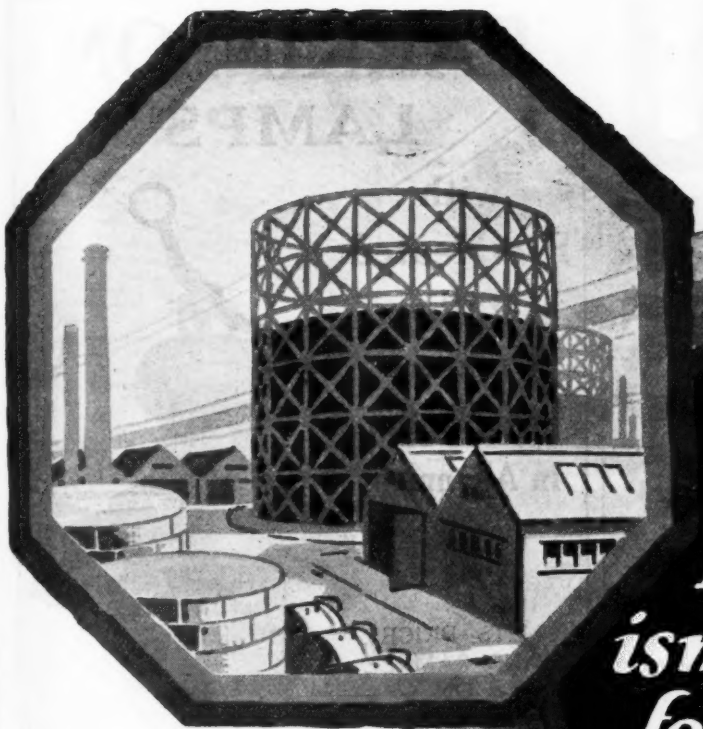

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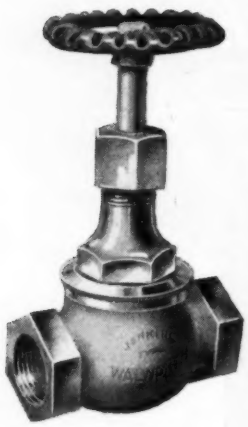

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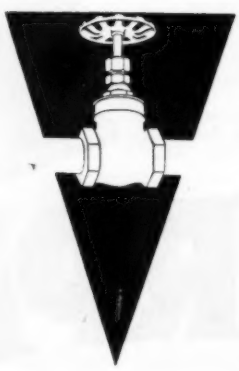

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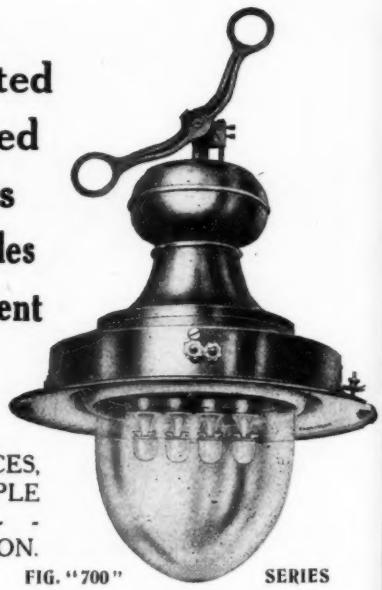

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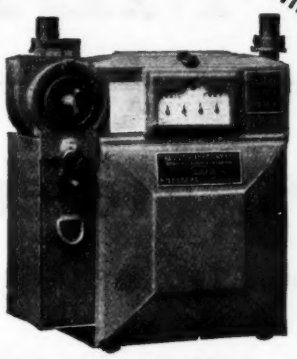

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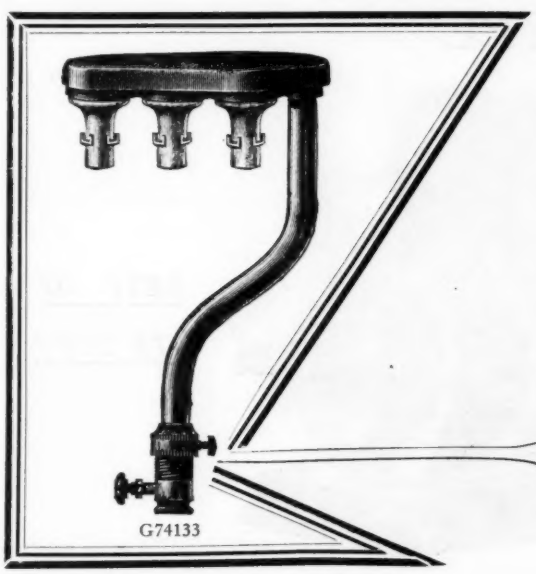

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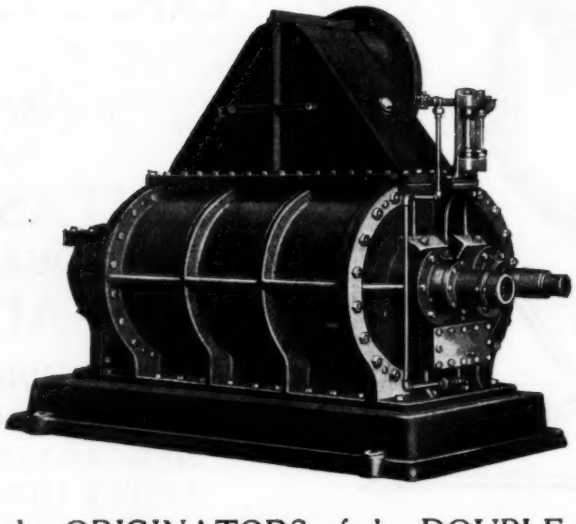

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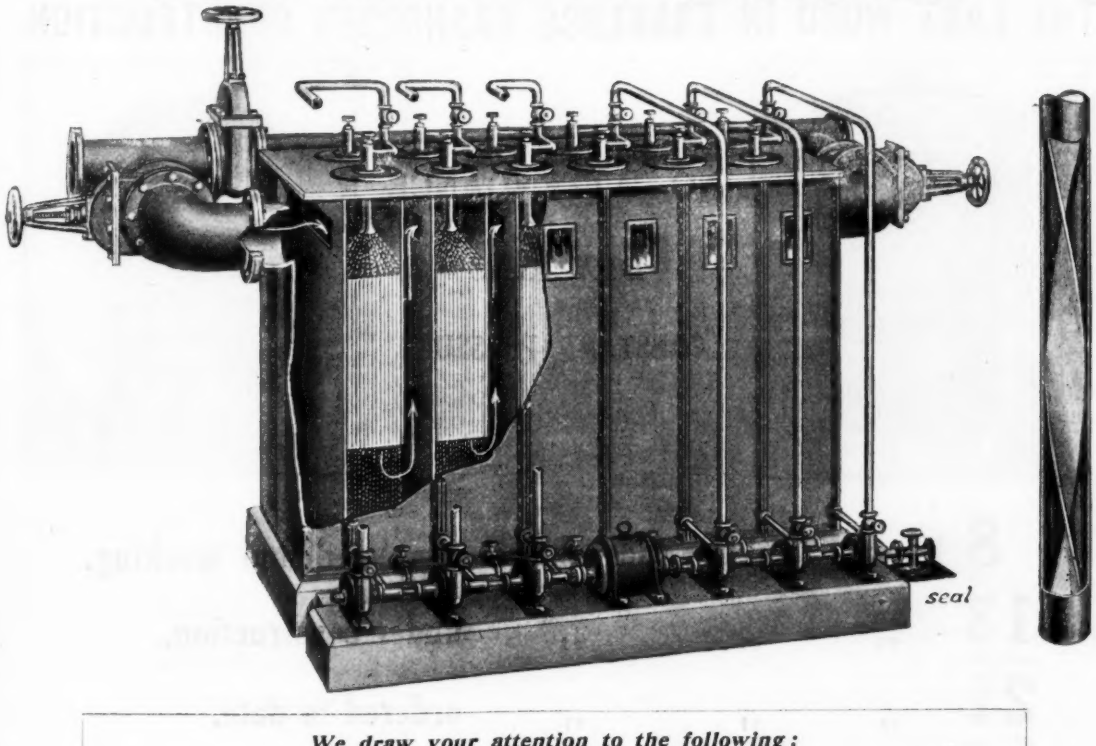

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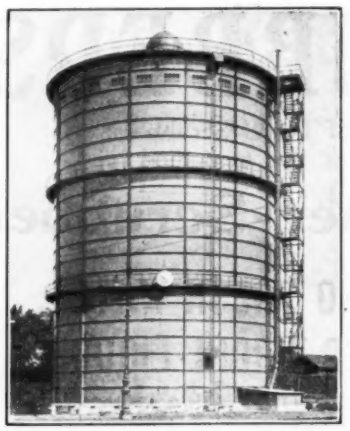

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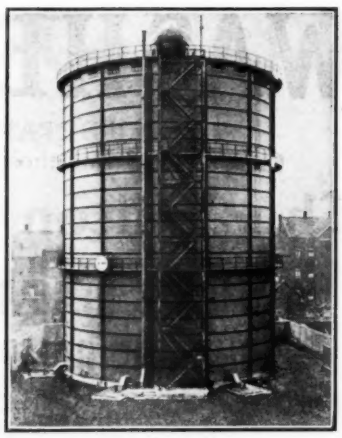

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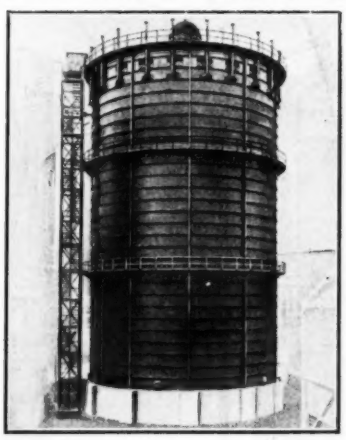

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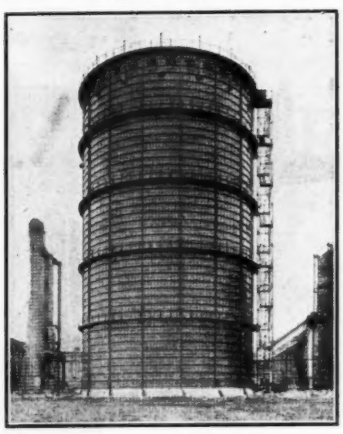

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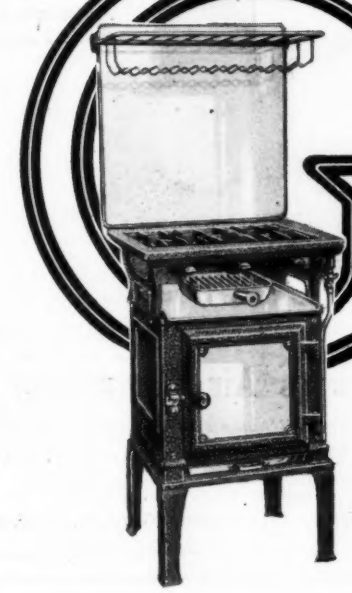

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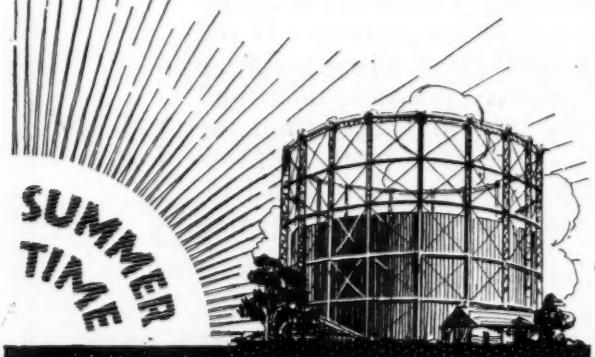

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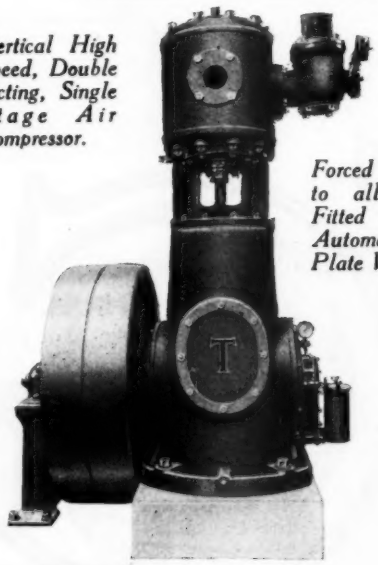

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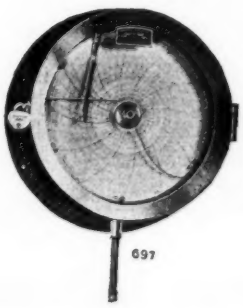

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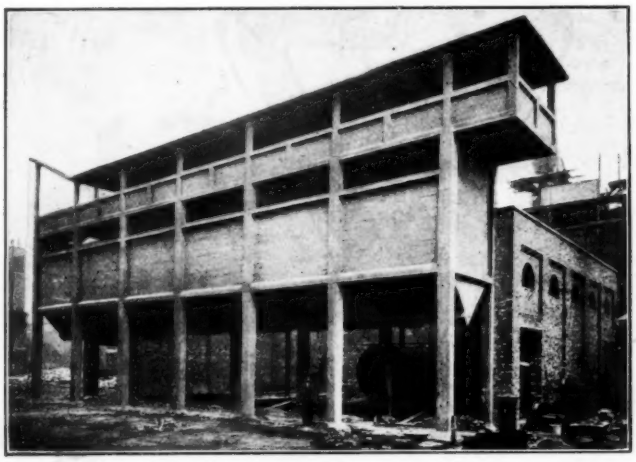

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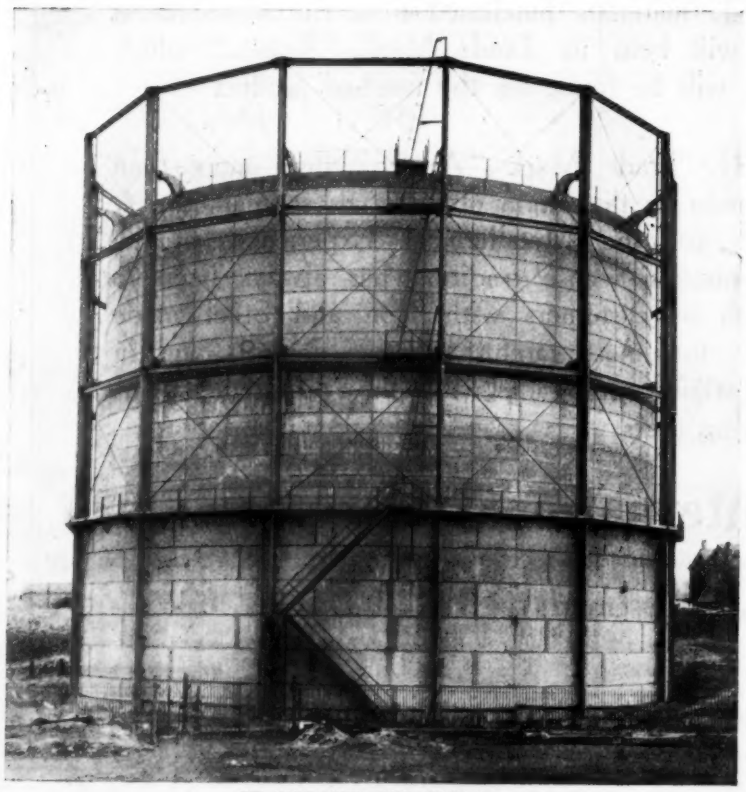

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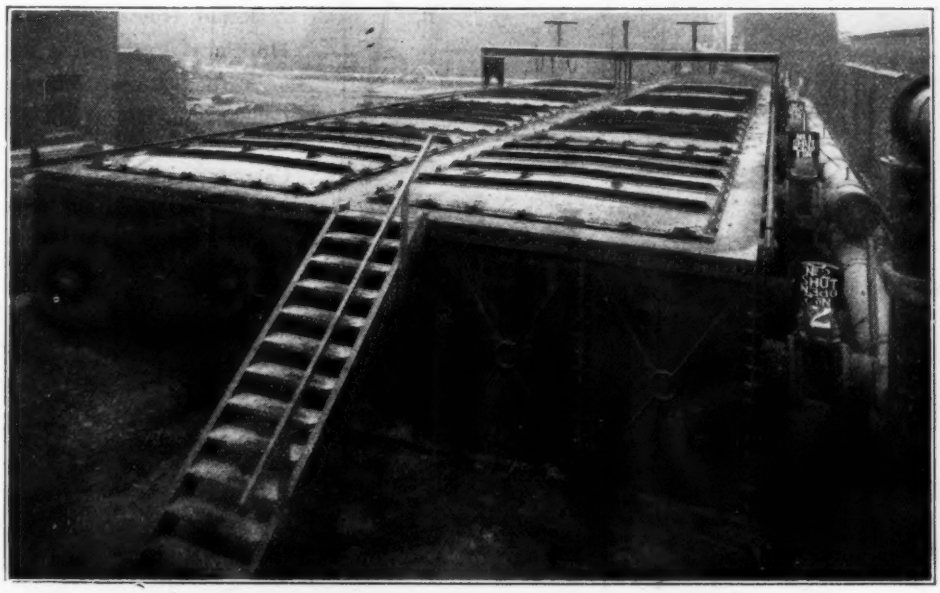

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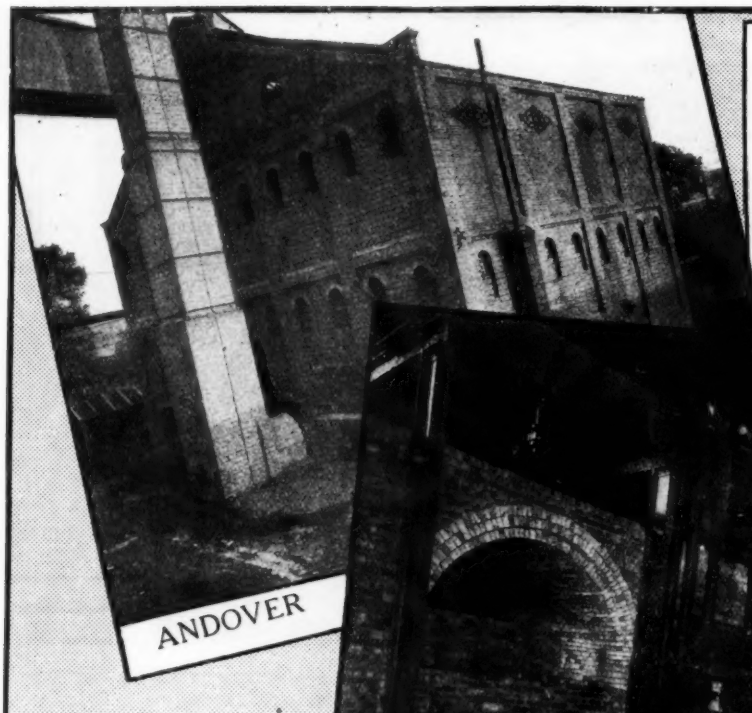

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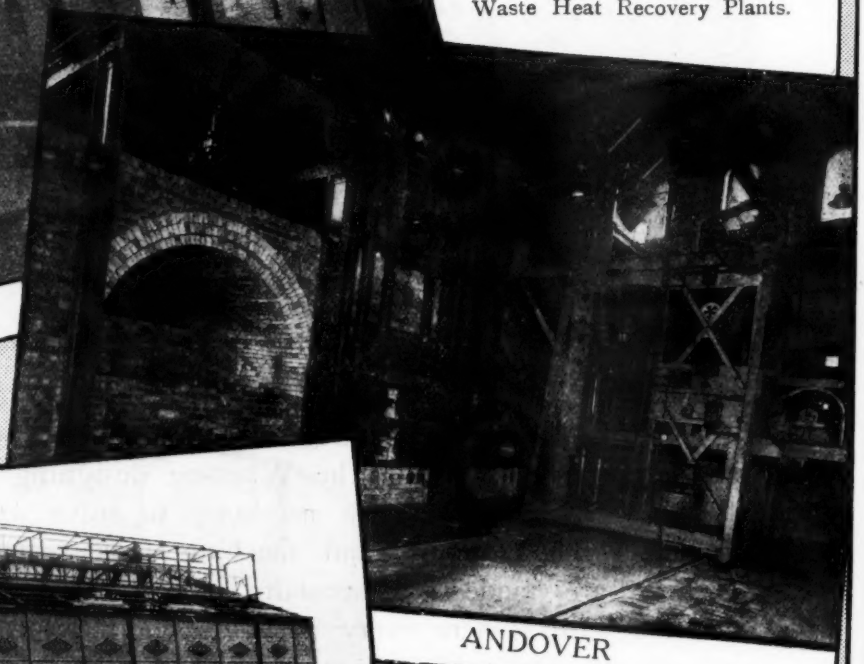
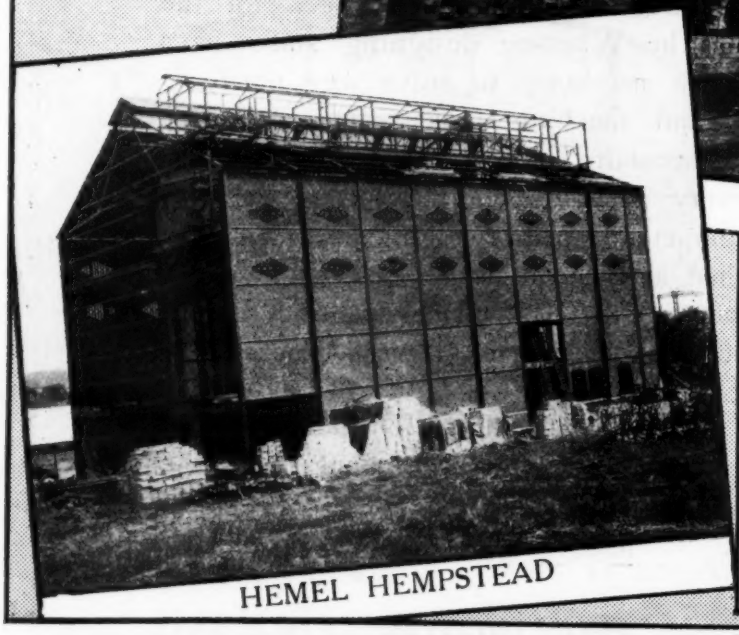


ANDOVER



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Charging and Discharging Machines.
Hot Coke Machines.
Coal and Coke Handling Plants.
Conveying Machinery.
Steel and Concrete Hoppers.
Transporters and Runways.
Constructional Steelwork.

GIBBONS BROS. LTD.

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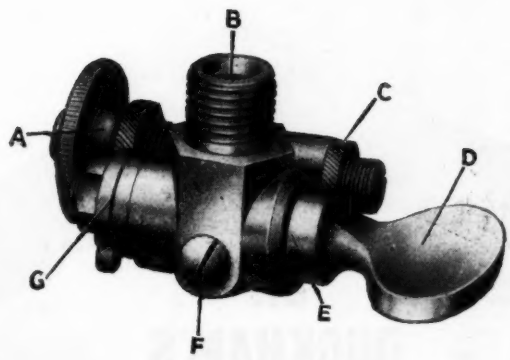
The Tap



CANNON Cooker Taps are made entirely from hot-brass stampings. This ensures closer texture of the metal, and consequent longer wear. The finish may be either plain brass or untarnishable plating. Note the following outstanding features of Cannon Taps:—

A. Air Disc, fitted with locking nut.

B. One-eighth inch "Cover" of metal in all directions at gas inlet.

C. Gas Control, fitted with locking nut.

D. Broad Thumbpiece; having no rim of metal between it and the plug, is consequently smooth to handle.

E. Special heat resisting grease on plug.

F. Greasing plug for renewal of grease (if ever necessary) without removing tap from gas-bar.

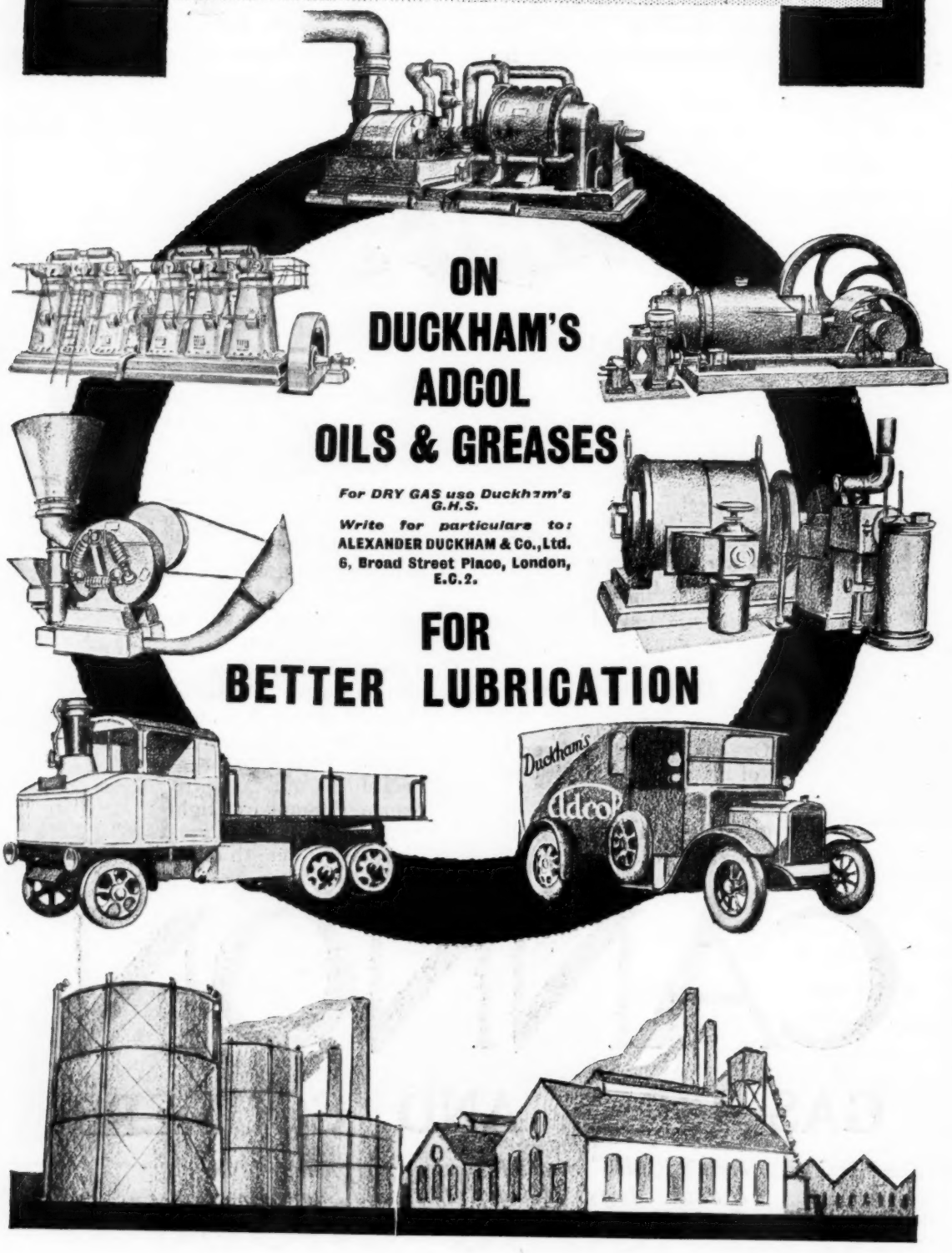
G. Patent Spring-Washer Nighting. Phosphor-bronze spring in protecting collar. Impossible for motion of tap to loosen nighting nut. Spring ensures standard tightness of tap and great increase in length of life.

CANNON

GAS FIRES AND COOKERS

Head Office and Works: Deepfields, Nr. Bilston, Staffs. London Office and Showrooms: Bath House, 57/60, Holborn Viaduct, E.C. 1.

SMOOTH RUN THE WHEELS OF INDUSTRY



ON DUCKHAM'S ADCOL OILS & GREASES

For DRY GAS use Duckham's G.H.S.

Write for particulars to:
ALEXANDER DUCKHAM & Co., Ltd.
6, Broad Street Place, London, E.C.2.

FOR BETTER LUBRICATION

The R.H.D. 166 "Acme New World" Gas Range in "Rado" Mottled Enamel Finish.

Supreme for Efficiency and Appearance

ARDEN HILL'S "ACME NEW WORLD" Gas Range combines efficiency with smart appearance in a way that is making it the popular choice of both Public and Gas Undertakings.

With all the "NEW WORLD" features—Single burner oven, direct bottom-flue-outlet, "Regulo" Automatic oven-heat control, and finished in "RADO" Mottled Enamel — the "ACME NEW WORLD" Gas Range is the last word in cooking efficiency.

ARDEN HILL'S

"ACME NEW WORLD"

'REGULO'-CONTROLLED

GAS RANGE

ARDEN HILL & CO., ACME WORKS, ASTON, BIRMINGHAM.

(Radiation Ltd., Proprietors.)

HUMPHREYS & GLASGOW, LTD.

WATER-GAS

	Cu. Ft. Daily
Aarhus	800,000
Abertillery	500,000
Abertillery	100,000
Admiralty:	
British	800,000
British	800,000
British	800,000
British	800,000
British	800,000
French	800,000
French	800,000
Agram	200,000
Airdrie	450,000
Aldershot	1,400,000
Aldershot	1,000,000
Aldershot	1,316,000
Algiers	1,760,000
Alkmaar	400,000
Allenstein	200,000
Alost	700,000
Amerasfoort	300,000
Amsterdam	1,000,000
Amsterdam	1,000,000
Amsterdam	2,700,000
Amsterdam	1,350,000
Antwerp	1,500,000
Antwerp	1,000,000
Antwerp	1,500,000
Antwerp	1,900,000
Arundel	215,000
Ascot	423,000
Ashford	250,000
Asnières	650,000
Augsburg	425,000
Aylesbury	150,000
Aylesbury	470,000
Banbury	200,000
Banff	125,000
Barmen	580,000
Barnsley	588,000
Barrow	300,000
Barrow	500,000
Barry	500,000
Barry	720,000
Bath	1,000,000
Bath	1,000,000
Bath	1,300,000
Bath	1,200,000
Bedford	1,000,000
Belfast	1,700,000
Belfast	4,500,000
Belfast	1,250,000
Belfast	1,250,000
Belfast	2,250,000
Benrath	125,000
Berkhampstead	259,000
Berlin:	
Charlottenb'g	2,500,000
Danziger Str.	1,600,000
Neukoelin	650,000
Neukoelin	700,000
Schmargendorf	760,000
Tegel	3,500,000
Tegel	6,350,000
Tegel	245,000
Berne, Switz.	725,000
Boxhill	400,000
Bideford	258,000
Bilston	375,000
Bilston	125,000
Birmingham:	
Adderley St.	675,000
Adderley St.	850,000
Nechells	3,000,000
Nechells	3,000,000
Nechells	3,000,000
Nechells	7,650,000
Swan Village	1,500,000
Windsor St.	3,000,000
Windsor St.	3,000,000
Windsor St.	6,100,000
Bishop's Stortford	200,000
Bishop's Stortford	300,000
Bishop's Stortford	200,000
Blackburn	1,100,000
Blantyre	150,000
Blois	125,000
Blois	125,000
Bochum	530,000
Bognor	100,000
Bognor	423,000
Bognor	500,000
Bo ness	125,000
Boulogne	340,000
Bournemouth	1,000,000
Bournemouth	500,000
Bournemouth	1,500,000
Bournemouth	1,000,000
Bournemouth	500,000
Bournemouth	1,530,000
Bournemouth	2,000,000
Bournemouth	500,000
Bournemouth	2,750,000
Bremen	550,000
Bremen	950,000
Bremen	850,000
Brentwood	250,000
Brescia	588,000
Brescia	588,000
Brest	550,000
Bridgwater	200,000
Bridlington	150,000
Bridlington	200,000
Bridlington	550,000
Brieg	100,000
Brierley Hill	250,000
Brierley Hill	425,000
Brighton	1,750,000
Brighton	1,850,000
Brighton	750,000
Brighton	2,750,000
Brighton	3,000,000
Bristol	2,000,000
Bristol	2,500,000
Bristol	825,000
Bristol	825,000
Bromley	1,500,000
Bruges	200,000
Bruges	600,000
Brussels:	
Anderlecht	350,000
Anderlecht	350,000
Forest	1,000,000
Forest	1,000,000
Forest	1,000,000
Forest	1,500,000
Forest	88,000
Koekelberg	1,000,000
St. Gilles	1,000,000
St. Josse	1,000,000
St. Josse	600,000
St. Josse	775,000
Ville	750,000
Ville	750,000
Ville	1,500,000
Ville	350,000
Bucarest	1,100,000
Buckie	164,000
Budapest	50,000
Budapest	1,750,000
Budapest	200,000
Budapest	250,000
Burnley	1,350,000
Caen	250,000
Cambridge	500,000
Cambridge	1,000,000
Cambridge	1,700,000
Cardiff	2,000,000
Cardiff	3,000,000
Cardiff	1,950,000
Cardiff	600,000
Carlisle	600,000
Carlsruhe	500,000
Carnarvon	248,000
Charleroi	1,250,000
Châteauroux	125,000
Châteauroux	125,000
Chatelet	500,000
Chester	564,000
Chesterfield	430,000
Chesterfield	90,000
Chesterton	197,000
Chichester	250,000
Chorley	300,000
Cie. des Coupteurs	1,150,000
Cie. Lorraine de Ch.	210,000
Cie. Mines de Roche	585,000
Coatbridge	400,000
Commercial, L'n	850,000
Commercial	850,000
Commercial	1,250,000
Commercial	2,000,000
Commercial	800,000
Commercial	2,100,000
Copenhagen	700,000
Copenhagen	2,500,000
Copenhagen	1,750,000
Copenhagen	1,200,000
Courtrai	250,000
Coventry	600,000
Coventry	600,000
Coventry	300,000
Coventry	1,250,000
Coventry	350,000
Cowdenbeath	420,000
Cracow	200,000
Cracow	200,000
Cranleigh	188,000
Crefeld	500,000
Crewe	700,000
Crewe	400,000
Crosfield & Sons	1,500,000
Crosfield & Sons	1,500,000
Crowborough	150,000
Croydon	1,250,000
Croydon	625,000
Croydon	625,000
Croydon	550,000
Croydon	650,000
Croydon	1,125,000
Croydon	150,000
Croydon	3,000,000
Croydon	6,000,000
Deal	250,000
Deal	250,000
Debrecsin	100,000
Derby	1,500,000
Derby	2,000,000
Deventer	150,000
Deventer	200,000
Devonport	1,000,000
Devonport	1,100,000
Doncaster	1,350,000
Dorking	150,000
Dorking	300,000
Dorking	130,000
Dover	500,000
Dublin	2,000,000
Dublin	2,000,000
Dublin	650,000
Dudley	600,000
Dundee	1,500,000
Dundee	1,650,000
Dunedin, N.Z.	150,000
Dunedin	275,000
Durham	200,000
Dusseldorf	1,000,000
Eastbourne	1,250,000
Eastbourne	1,550,000
Edinburgh	2,000,000
Eindhoven	1,500,000
Enschede	282,000
Epping	500,000
Epsom	225,000
Epsom	300,000
Essen	1,400,000
Essen-Borbeck	1,400,000
Exeter	1,100,000
Exeter	1,200,000
Exmouth	376,000
Falmouth	150,000
Falmouth	200,000
Faversham	200,000
Flensburg	300,000
Flensburg	125,000
Fond. del Pignone	164,000
Forst	300,000
Frankenthal	175,000
Fuel Research Wks.	500,000
Fuel Research Wks.	500,000
Furnes	500,000
Gabionz	140,000
Gas L. & C. Co.:	
Beckton	10,000,000
Beckton	7,000,000
Beckton	3,500,000
Beckton	7,000,000
Beckton	7,000,000
Beckton	5,253,000
Beckton	4,500,000
Beckton	3,000,000
Beckton	1,500,000
Bow Common	1,000,000
Bow Common	1,150,000
Bow Common	150,000
Brentford	1,200,000
Brentford	850,000
Brentford	350,000
Brentford	750,000
Bromley	3,750,000
Bromley	2,250,000
Bromley	1,000,000
Bromley	1,000,000
Bromley	1,000,000
Bromley	1,450,000
Bromley	1,350,000
Fulham	2,500,000
Fulham	1,700,000
Ilford	650,000
Ilford	750,000
Kensal Green	2,250,000
Kensal Green	2,250,000
Kensal Green	2,250,000
Nine Elms	2,750,000
Nine Elms	750,000
Nine Elms	1,870,000
Nine Elms	2,850,000
Shoreditch	900,000
Shoreditch	2,700,000
Shoreditch	2,725,000
Southall	2,000,000
Southall	3,000,000
Staines	600,000
Stratford	1,700,000
Stratford	850,000
Stratford	2,350,000
Stratford	2,350,000
Gelsenkirchen	175,000
Gelsenkirchen	350,000
Geneva	500,000
Geneva	700,000
Geneva	1,270,000
Gennevilliers	10,600,000
Gennevilliers	2,300,000
Girvan	235,000
Glasgow	3,000,000
Glasgow	2,500,000
Glasgow	2,250,000
Glossop	340,000
Gloucester	800,000
Gloucester	1,000,000
Gosport	200,000
Gosport	225,000
Göteborg	300,000
Göteborg	600,000
Graudenz	200,000
Grays	250,000
Grays	400,000
Grays	725,000
Groningen, Holland	500,000
Guest Keen & Piggotts, Ltd.	1,936,000
Guildford	300,000
Guildford	200,000
Guildford	350,000
Guildford	1,100,000
Guildford	150,000
Haarlem	850,000
Hamburg	1,750,000
Hampton Court	500,000
Hampton Court	600,000
Hampton Court	1,100,000
Hanley	800,000
Hanley	800,000
Hartlepool	750,000
Hartlepool	765,000
Hastings	1,250,000
Haywards Heath	470,000
Hebden Bridge	200,000
Heidelberg	200,000
Hereford	525,000
Hertford	197,000
Hertford	244,000
Hessle	150,000
Heywood	500,000
High Wycombe	752,000
Hilversum	850,000
Hinckley	250,000
Holyhead	197,000
Hong Kong	450,000
Hong Kong	450,000
Hornsey	1,000,000
Hornsey	1,000,000
Hornsey	750,000
Hornsey	750,000
Horsham	235,000
Hull	1,500,000
Hull	1,000,000
Hull	1,600,000
Innsbruck	200,000
Ipswich	750,000
Ipswich	1,250,000
Ipswich	600,000
Jersey	564,000
Jersey	564,000
Kampen	350,000
Karlsbad	350,000
Kendal	329,000
Kidsgrove	235,000
Kiel	1,000,000
Kiel	880,000
Kilmarnock	500,000
Kilmarnock	585,000
King's Lynn	197,000
King's Lynn	400,000
Kingston-on-Th.	3,400,000
Kirkintilloch	360,000
Kirkintilloch	827,000
Kolozvar	100,000
Lancaster	500,000
Langley Mill	500,000
Largs	235,000
Lausanne	250,000
Lausanne	385,000
Lausanne	970,000
Le Mans	420,000
Lea Bridge	350,000
Lea Bridge	350,000
Lea Bridge	400,000
Lea Bridge	1,000,000
Lea Bridge	1,500,000
Lea Bridge	1,530,000
Leamington	600,000
Leamington	525,000
Leatherhead	705,000
Leeds	1,500,000
Leeuwarden	400,000
Leiden	500,000
Leiden	575,000
Leigh	350,000
Lemberg	260,000
Lemberg	500,000
Letchworth	362,000
Letchworth	423,000
Liége	1,000,000
Liége	750,000
Lille	860,000
Lincoln	500,000
Lincoln	393,000
Liverpool	3,500,000
Liverpool	4,500,000
Liverpool	750,000
Liverpool	1,750,000
Liverpool	1,250,000
Liverpool	3,000,000
Liverpool	1,500,000
Liverpool	1,250,000
Liverpool	2,350,000
Long Eaton	430,000
Long Eaton	170,000
Longton	600,000
Louvain	800,000
Lubeck	400,000
Luton	400,000
Maastricht	200,000
Macclesfield	300,000
Magdeburg	1,400,000
Maidenhead	225,000
Maidenhead	225,000
Maidenhead	175,000
Maidenhead	175,000
Maidenhead	200,000
Maidenhead	200,000
Maidstone	500,000
Maidstone	1,250,000
Malines	500,000
Malines	575,000
Malmö	350,000
Malta	400,000
Manchester	3,500,000
Manchester	3,500,000
Manchester	1,500,000
Mansfield	330,000
Mansfield	493,000
Margate	960,000
Marlborough	100,000
Mayence	700,000
Melbourne	5,000,000
Merthyr Tydfil	300,000
Merthyr Tydfil	200,000
Middlesbrough	1,250,000
Middlesbrough	750,000
Middlesbrough	900,000
M.M. Woolston	9,000,000
Monaco	275,000
Monaco	618,000
Monaco	618,000
Mons	500,000
Montevideo	1,222,000
Morecambe	333,000
Moscow	1,000,000
Munich	1,400,000
Namur	175,000
Narbonne	350,000
Nelson	400,000
Nelson	350,000
Neuss	140,000
Newbury	250,000
Newcastle	2,500,000
Newcastle, N.S.W.	500,000
Newhaven	235,000
Newport Pagnell	188,000
Nice	900,000
Nictheroy	250,000
N. Middlesex	150,000
N. Middlesex	200,000
N. Middlesex	75,000
N. Middlesex	650,000
N. Middlesex	650,000
N. Middlesex	1,000,000
North Sydney	500,000
North Sydney	500,000
Norwich	1,000,000
Norwich	300,000
Norwich	500,000
Norwich	1,500,000
Nottingham	1,000,000
Nottingham	1,000,000
Nuneaton	125,000
Oberhausen	175,000
Oldbury	500,000
Oldenburg	200,000
Ormskirk	170,000
Ostend	100,000
Ostend	200,000
„ Zandvoorde	700,000
Palermo	968,000
Palermo	850,000
Paris:	
Clichy	4,000,000
Ivry	1,570,000
Landy	6,000,000
Landy	6,000,000
Landy	5,295,000
La Villette	4,000,000
La Villette	2,000,000
St. Mandé	1,570,000
Paris-Plage	125,000
Pau	550,000
Pavie	194,000
Pavie	212 000
Pembroke	240,000
Perigueux	350,000
Perth, W.A.	125,000
Perth, W.A.	1,000,000
Petone, N.Z.	200,000
Piggott & Co.	1,500,000
Plymouth	2,000,000
Poitiers	350,000
Pontypool	120,000
Port Elizabeth	400,000
Portsmouth	1,000,000
Portsmouth	2,000,000
Portsmouth	800,000
Portsmouth	2,000,000
Posen	450,000
Posen	700,000
Prague	140,000
Preston	1,400,000
Ramsgate	430,000
Reading	1,000,000
Reading	1,000,000
Reading	600,000
Redditch	500,000
Redhill	275,000
Redhill	330,000
Redhill	1,100,000
Reichenberg	209,000
Reichenberg	200,000
Reval	350,000
Rhymney	175,000
Rhymney	250,000
Riddings	258,000
Ripley	120,000
Rochester	2,200,000
Rochester	2,800,000
Romford	300,000
Romford	350 000
Romford	1,200,000
Rotterdam	850,000
Rotterdam	1,500,000
Rotterdam	750,000
Rotterdam	750,000
Rotterdam	600,000
Rotterdam	2,000,000
Royston (Yorks.)	259,000
Rugby	1,000,000
Rugby	450,000
Rushden	425,000
Rushden	517,000
Ryde	500,000
Saffron Walden	235,000
St. Albans	700,000
St. Albans	580,000
St. Andrews	210,000
St. Andrews	409,000
St. Gallen	225,000
St. Gallen	225,000
Ste. Ch.Gr. Paroisse	1,320,000
Sté. Kuhlmann	1,270,000
Sté. Kuhlmann	3,200,000
Sté. Kuhlmann	2,150,000
Sté. Tubes Meuse	545,000
San Paulo	700,000
Scarborough	800,000
Scarborough	200,000
Scarborough	350,000
Scarborough	1,300,000
Scarborough	1,350,000
Seaford	200,000
Shanghai	225,000
Shanghai	225,000
Shanghai	1,600,000
Shanklin	259,000
Shanklin	400,000
Sheerness	200,000
Sheerness	180,000
Sheerness	200,000
Sheerness	220,000
Sheffield	1,530,000
Sheffield	3,000,000
„ Steel Prods.	5,000,000
Shirebrook	500,000
Shrewsbury	300,000
Shrewsbury	170,000
Sidmouth	225,000
Singapore	600,000
Sittingbourne	259,000
Southampton	800,000
Southampton	500,000
Southampton	600,000
Southampton	100,000
Southampton	1,000,000
Southampton	1,450,000
Southend	1,250,000
Southend	900,000
Southend	900,000
Southgate	400,000
Southgate	500,000
Southgate	300,000
Southgate	500,000
Southport	750,000
Southport	900,000
Southport	900,000
Southport	450,000
South Shields	650,000
South Shields	1,250,000
Stafford	500,000
Stettin	880,000
Stirling	400,000
Stirling	970,000
Stockholm	1,500,000
Stockholm	1,750,000
Stockport	600,000
Stockport	600,000
Stockport	400,000
Stockport	400,000
Stockton	500,000
Stockton	250,000
Stourbridge	500,000
Stourbridge	500 000
Sunderland	2,250,000
Sunderland	300,000
Sutton	1,269,000
Sutton	1,625,000
Swanage	300,000
Swansea	550,000
Swansea	1,000,000
Swansea	450,000
Swansea	1,250,000
Swansea	2,000,000
Swindon	300,000
Swindon	450,000
Swindon	400,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	1,000,000
Sydney	1,000 000
Sydney	8,250,000
Taunton	225 000
Taunton	350,000
Tawe Valley	275,000
Teignmouth	200,000
The Hague	1,000,000
The Hague	500,000
The Hague	1,750,000
The Hague	1,500,000
The Hague	775,000
The Hague	1,500,000
The Hague	2,330,000
Tilburg	400,000
Tirlemont	120,000
Tokyo	2,000,000
Torquay	350,000
Torquay	350,000
Torquay	320,000
Tottenham	750,000
Tottenham	750,000
Tottenham	350,000
Tottenham	1,000,000
Tottenham	1,000,000
Tottenham	1,250,000
Tottenham	2,500,000
Tottenham	1,000,000
Tottenham	500,000
Tottenham	1,000,000
Toulouse	1,800,000
ToulouseNatl. Wks.	2,400,000
ToulouseNatl. Wks.	6,200,000
Tournai	700,000
Tours	550,000
Trowbridge	250,000
Trowbridge	150,000
Tunbridge Wells	1,000,000
Tunbridge Wells	1,000,000
Tunis	400,000
Tynemouth	1,100,000
Tynemouth	1,100,000
Ulm	400,000
Union Chim.-Belge	1,977,000
Utrecht	1,000,000
Utrecht	1,000,000
Uxbridge	752,000
Uxbridge	1,000,000
Vancouver	3,800,000
Verviers	1,000,000
Vevey, Switz.	650,000
Victoria, B.C.	500,000
Vienna	3,500,000
Vienna	2,500,000
Walsall	750,000
Walsall	375,000
Waltham	800,000
Waltham	140,000
Wandsbek	125,000
Wandsworth	1,800,000
Wandsworth	4,230,000
Wanganui, N.Z.	376,000
Ware	150,000
Ware	282,000
Warwick	125,000
Wasmuel	500,000
Watford	300,000
Watford	350,000
Watford	400,000
Watford	1,250,000
Wath	433,000
Weimar	100,000
Wellingborough	525,000
Wellingborough	525,000
Wellington, N.Z.	550,000
Wellington	300,000
West Bromwich	550,000
Westgate	250,000
Weston-Mare	350,000
Weston-Mare	350,000
Weston-Mare	150,000
Weston-Mare	150,000
Weston-Mare	500,000
Wexford	100,000
Weymouth	400,000
Weymouth	100,000
Weymouth	658,000
Whitstable	423,000
Widnes	500,000
Wiesbaden	850,000
Wigston	250,000
Winchester	225,000
Winchester	125,000
Winchester	410,000
Winchester	325,000
Woking	400,000
Wolverhampton	1,500,000
Wolverhampton	1,000,000
Wolverhampton	250,000
Wolverhampton	400,000
Worthing	525,000
Yarmouth	500,000
Yarmouth	125,000
Yeovil	340,000
Zwolle	200,000
Zwolle	200,000
Zwolle	700,000

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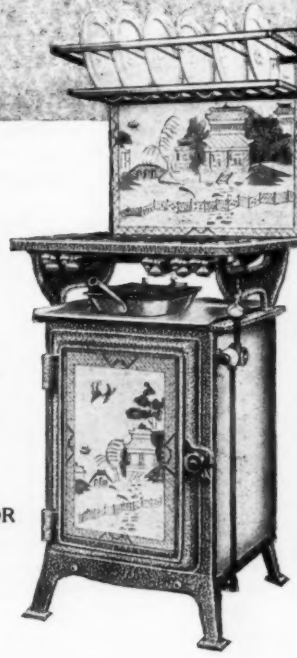

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VOL. CXC. No. 3491.] WEDNESDAY, APRIL 16, 1930. [82ND YEAR.

Editorial Notes.

"Externals"—and Flexibility.

We have grown accustomed to stimulating addresses from Presidents of the North British Association of Gas Managers, and the one delivered by Mr. David Fulton at the Spring Meeting last Friday, the first part of which is published on later pages to-day, is no exception. Mr. Fulton is a thorough-going Scot, which implies, among a host of other things, that he is keen to learn, anxious to apply this learning, determined that no effort on his part shall be spared in imbuing younger members of our industry with the Scot's traditional thirst for knowledge, and not afraid to express definite opinions on questions to which he has given thought.

Mr. Fulton, as Hon. Secretary of the Scottish District Advisory Committee on the Education Scheme of the Institution of Gas Engineers, has done "seven years' hard," and he expresses gratification that the number of young men taking up the specified course of gas training is steadily increasing—a feeling which is shared by all. This increase in interest must be due largely to the modifications recently made to the Scheme, whereby external students are given a fair chance. "There is no stigma attached to being an external student," says Mr. Fulton. We are in complete agreement with this idea, though fully appreciating the obvious advantages possessed by internal students. It is often true that an external student—our remarks here do not apply solely to training in gas engineering or gas supply—has more grit and ambition, a greater "will to win," and fewer spoon-fed notions, than many an internal student who does not realize the advantages he ought to exploit. The time is coming in the gas industry, as in every business and profession, when a candidate to a responsible position will be asked, What can you do?—not whether he wears a regulation hat on a regulation head replete with regulation knowledge.

The Education Scheme has been made more flexible and infinitely more useful by recent modification; and we believe that the external student will have a beneficial effect on the internal teacher. We are always hearing about the delinquencies of students; seldom do we hear about inflexible teachers who follow a set road of training as an electric tram follows the rails. Is it that teachers are beyond criticism? We think not, and are sure that teachers need training in the evaluation of quality of mind just as the young need training in the manner in which the mind can best be filled with useful knowledge. But this subject is too wide to discuss here; we mention it simply to emphasize that the Education Scheme can prosper only on a flexibility of outlook on the part of administrators of undertakings and teachers of gas subjects. As Mr. Fulton remarks, "the true object of the Scheme is a sound educational training . . . academic qualifications must be complementary, not superior, to practical training." In brief, there must be a happy balance between theory and practice. In this regard, think once again of the external student; he usually has the basis of his education in practice, not in theory, and not infrequently he temporarily needs an overdose of theory.

Encourage Individualism.

In his address, Mr. Fulton suggests that it would have been better had the Institution made the course for the Higher Grade Certificates at least one year longer; in support of this view he points to the proportion of second-class certificates to first-class certificates. All things considered, we can have faith in a defined extra year only as a theoretical ideal. There are students of sufficient capacity to arrive at the requisite first-class standard in the specified time, and it would be unfair to penalize them in order to serve the interests of their slower-witted brethren. To carry such an idea to its logical conclusion, first-class brains would leave the gas industry for other fields of service where brilliance might be more appreciated.

The close of the last paragraph leads inevitably to expression of our belief in the value of individualistic effort. We are constantly urging co-operation; from time to time, in special circumstances, we endeavour to put forward the advantages of centralization. Throughout, however, we realize that the success of any scheme is dependent not on a new office, a different system of filing, better note-paper, or anything like that, but upon individual effort. Co-ordination of research, for example, which at present is a need too obvious to labour, does not imply lessened individualistic work; otherwise there would in a few years be little of value to co-ordinate. It would be a case of dry rot in the laboratory. So dry rot will attack our industry if the idea becomes current that corporate action by central organizations can accomplish all that is necessary; hence our complete agreement with Mr. Fulton that "the actions of the central bodies must be supported by undiminished individual effort . . . the strength of the whole body depends on the strength of the individual."

There is plenty of room in our industry for criticism; but it must be criticism of the hard-working man who is pulling his weight while he is using his voice or his pen. There is no room for the arm-chair expert. Neither is there any room for jealousy or obsession, though both can be found without the aid of telescope or microscope. By jealousy we mean the hard-baked, ultra-conservative administrator who resents external suggestion; by ob-

session we mean the administrator who believes that amalgamation *per se* is all-sufficient to work good. The process of gas manufacture is a peculiar one; efficiency cannot invariably be judged by size—on which matter Mr. Fulton has some excellent observations.

We have commented on a few only of the significant passages in Part I. of the address. The second part, which will be published in the "Journal" next week, is concerned chiefly with the Helensburgh Gas Undertaking—a concern which has developed apace under the guidance of Mr. Fulton.

Salesmen's Day.

None has been more enthusiastic, as none has offered more promise of lasting good results, than the seventh annual meeting of the Gas Salesmen's Circles, organized under the auspices of the British Commercial Gas Association, which was held in London on Friday of last week. There is now a more appropriate place than the "Journal" for a full report of such a meeting; that is to say, in the publication which devotes itself entirely to the selling side of the gas industry, and is therefore regarded as "the salesman's own paper"—the "Gas Salesman."

Within a few hours of the posting of this issue of the "Journal," there will be on its way to every part of the country the April number of the "Gas Salesman," containing a verbatim report of the proceedings at Caxton Hall last Friday, when those taking part in Salesmen's Day were addressed by Mr. F. W. Moore, and at the subsequent luncheon in the Whitehall Rooms, when a party of well over two hundred sat down to luncheon as the guests of the Gas Light and Coke Company, with Sir David Milne-Watson, LL.D., D.L. (the Governor), in the chair. A profitable day concluded at Olympia, where, at the moment, both home lover and home provider are able to pick up ideas and ideals by the score. Members of the gas industry who have not yet recognized the undoubted need of keeping themselves fully abreast of the selling side by subscribing to the "Gas Salesman," should at all events make a point of perusing the April issue, for in it will be found doses of health-giving tonic, one teaspoonful of which is of greater potency as an energizer than a nine-gallon cask of self-disparagement.

The gas salesman may not have everything as he would like it, and in too many cases his remuneration is not what it should be; but while listening to Sir David Milne-Watson at last Friday's luncheon, one could not help thinking that salesmanship as a vocation possesses many things to recommend it. From the very nature of his business, the salesman can have a bright smile for everyone with whom he may come in contact; he can have a cheery word for everyone he may have to address; and he can offer assistance to any who need it. In these ways he is able to secure for himself the best that life has to offer, and at the same time he serves to the utmost the particular undertaking of which he forms a part.

The Strange Tale of Barnsley.

Some day a statue may be put up to perpetuate the memory of 181 tenants of Barnsley Council Houses who dared to prefer gas. Six months or more ago, the matter was referred to in the "Journal;" but so extraordinary was the state of affairs revealed that we had expected it to be put an end to long ere this. To the person desiring a maximum of comfort at a minimum of expense, nothing would seem more natural than a supply of gas, and so one may declare unhesitatingly that such a supply should be made available. There have been other views indicated in the Barnsley Town Council. The matter was originally brought to notice by a protest uttered by the Chairman of the Barnsley Gas Company at the annual meeting. According to him, the Barnsley Corporation, in their housing schemes, have spent much of the ratepayers' money in the erection of some 2000 dwellings; and so anxious were they to make their wishes clear that they issued a notice to tenants pointing out to them that:

"In no circumstances must you permit gas to be installed "in your premises. If this is done, it will be regarded "as a breach of the conditions of your tenancy, and the "Council will be compelled to serve notice to quit, and "take steps to obtain possession of your house."

Our remembrance is that some sort of explanation followed, but to our surprise the matter remains after all this time much where it was; for there appeared in a local paper published a few days ago a statement to the effect that, after considering the action of the Company in installing gas in 181 houses on the Carlton Lane scheme, a Sub-Committee recommended that notice be given to the whole of the tenants of houses where gas had been installed terminating their tenancy, unless they gave an undertaking to have such installation removed. The Corporation surely cannot depend upon tactics of this kind for the support of their own Electricity Department; and compulsion in such a matter is not the way to create that goodwill which is generally accepted as being the soul of business. However, the Chairman of the Housing Committee agreed to take back the minute for further consideration, and it is to be hoped that wiser counsels will prevail. It is what one of the members of the Council termed it, "a tyrannical policy;" and one must sympathize with him in asking why it was not possible to "come into the field in fair competition with gas."

The position of the Gas Company is that, on the application of an owner or a tenant, they are entitled to supply gas to a house; and if the agreements between the Council and the tenants are framed so as to prevent the latter from exercising any choice in the matter of lighting, heating, or cooking medium, the sooner they are altered to conform more nearly to generally accepted standards of reasonableness, the better it will be for all concerned.

Aberdeen.

"It is very pleasing to feel that at no time in an existence of sixty-nine years has the vigour of the Association been greater, or the spirit of comradeship among the members more real." Such is the opinion of Mr. David Fulton, expressed in his Presidential Address to the North British Association last week in Helensburgh, that fair Clyde-side town of some 10,000 inhabitants which is working on a town-planning scheme 100 years old, and is supplied by Mr. Fulton with gas at 5·68d. per therm. And the President's statement was not belied by the event, for the meeting was packed, and members came to it from Thurso in the North and Annan in the South. This note, however, is not so much to underline the Spring Meeting, which is fully covered elsewhere in these pages, as to direct attention to Aberdeen, which is to be the venue of the Association's Annual Meeting on September 10, 11, and 12. It is 18 years since Mr. Samuel Milne was President, and in his capacity as Gas Engineer and Manager to the Corporation welcomed the members to the Granite City. The programme was noteworthy, for in addition to Mr. Milne's Address there were the first Young Memorial Lecture (delivered by Dr. Harold Colman), and papers by Messrs. George Keillor, W. Carmichael Peebles, S. B. Langlands, and William Blair—the last-named was Mr. Fulton's predecessor at Helensburgh, and his subject was "A Year's Work with Vertical Retorts." This year's President and Council intend that the September programme shall be no less attractive, and ask that all roads five months hence may converge upon Aberdeen.

Gas Section at the Next B.I.F.

The Gas Industries Section Committee of the British Industries Fair, Birmingham, are convinced—and we agree with them—that the gas industry as a whole has definitely benefited by participation as a properly organized section in the Fair, and recommend that every effort be made to secure a continuance of this Section next year. To this end, the national organizations have been approached; and co-operation may be relied upon to maintain the envied position which gas has held in connection with preceding Fairs.

A Joint Conference Suggested.

It is felt now that no British Industries Fair will be complete without its Joint Gas Conference, and that a conference of

this character should be organized for next year's Fair. February, 1931, seems a long way off now, but it is none too soon to begin laying plans. There are few gas men who do not find an opportunity to visit the Gas Industries Section of the Fair, and the occasion is therefore one of the best that could be found for a conference under the joint auspices of the national organizations. There have been good papers and good discussions at previous conferences, and next February may be counted upon to provide no less tempting fare. These Joint Conferences present a unique opportunity of discussing matters of interest to the industry in general.

The Lewisham Lighting Experiments.

Owing largely to the public interest aroused among motorists and road authorities in different parts of the country by the street-lighting experiments now taking place in South London (already described fully in the "Journal"), the Works Committee of the Lewisham Borough Council have postponed their decision on the relative values of gas and electricity for street-lighting purposes. The Committee, in a report to the Council, state that they have very carefully considered the two miles of experimental lighting recently installed in the High Street at Lewisham. They are satisfied with the manner in which the lamps have been erected, and express to the two Companies concerned—the South Metropolitan Gas Company and the South Metropolitan Electric Light and Power Company—their appreciation of their action in the matter. They are still considering the whole question, and intend to report fully to the Council at a later date.

Amenities.

Glancing over the pages of a leading Provincial newspaper recently, attention was attracted to a leader commenting upon the leisureness of issue by the Electricity Commissioners of a circular to undertakers concerned with the preparation and execution of national "grid" schemes. The writer points out that "it was in December that members of the Council for the Preservation of Rural England had an interview with Mr. Herbert Morrison for the purpose of impressing upon him the grave danger to rural amenities lurking in insufficiently considered or selfishly misconceived electrical development schemes. It was by no means a new problem that was thus brought to his notice. A Lake Country project involving the erection of a lamentably conspicuous transmission line in the neighbourhood of Keswick had already been challenged; and, like this, a scheme which threatened the amenities of the South Downs had aroused more than local concern." Now the Commissioners commend for particular consideration some of the ideas which that deputation voiced. The Commissioners agree that "before erecting overhead lines in areas of notable beauty, careful consideration should be given to the question of practicable alternative routes and of following depressions rather than the sky-line;" and they point out that ugly, ill-designed, obnoxiously assertive stations and sub-stations "can in many cases be rendered inconspicous by careful siting or masking with trees," as well as that in villages "it is essential that attention should be given to the architectural design of neighbouring buildings of importance and the architectural tradition of the locality." Our contemporary seems surprised that it should have taken three months or more to instruct the undertakers as to what is officially expected of them, but one is inclined rather to ask whether it should have been necessary to do so at all.

The Central Electricity Board's Report.

The matter of transmission is mentioned also in the second annual report of the Central Electricity Board, dealing with the year 1929. In this it is stated that during the twelve months the Board obtained wayleaves for 2099 tower sites on primary lines, and 1206 on secondary lines, making a total of 3305. Figures like these emphasize the need for careful consideration in the matter of sites. Indeed, the Board acknowledge the help and co-operation they have received from the National Trust and other Societies interested in the preservation of public amenities. They have also discussed with the Ancient Monuments Board the question of avoiding buildings or sites which are scheduled as ancient monuments.

Personal.

Mr. W. E. Dean, who has held the position of Engineer, Manager, and Secretary of the Exmouth Gas Company for sixteen years, has been appointed to a seat on the Board. At the annual meeting of the Company, the Chairman, Mr. E. T. Linscott, said that the increased sales (8·5 p.ct.) were in excess of their estimated curve of expansion as predicted by Mr. Dean two years ago. He congratulated Mr. Dean, now Managing Director, upon his successful year of office as President of the Southern Association of Gas Engineers and Managers, and on his election as a Member of the Institution of Mechanical Engineers.

Mr. R. C. Taylor, B.Sc., A.M.I.Mech.E., has been appointed to fill the position of Assistant Engineer to the Portsmouth Gas Company, in succession to Mr. S. E. Whitehead. Some notes on Mr. Taylor's career will be published in the "Journal" next week.

It will interest many who were members of the Institution party to Berlin last summer to know that Dr. Barth, who contributed so largely to the enjoyment of the visit, has left the Berlin Municipal Gas Undertaking to become Manager of the Progas-Union G.m.b.H., whose governors and other appliances, it will be remembered, evoked considerable interest at the Exhibition.

Mr. Harry Butterworth, Chief Representative of Messrs. Parkinson & Cowan (Gas Meters), Ltd., has been elected to a seat on the Board.

Obituary.

The death is announced, on April 5, of Dr. Frederick Lux, the inventor of the gas purifying material of that name. Dr. Lux, who celebrated his 76th birthday in November last, studied chemistry, first under the famous chemist Fresenius, and later at the Wurtzburg University, and his thorough knowledge of gas manufacture was acquired at the Mayence gas-works. It was when he was connected with the Palatinate Railways at Ludwigshafen that his attention was attracted to what was then considered a waste product at the chemical works of the firm of Von Giulini. Analysis of this product proved it to be hydroxide of iron having a strong alkaline reaction, and it not unnaturally occurred to him that its application to current gas practice might herald a new era in the economics of gas purification. Investigation of its properties at the Mayence gas-works quickly demonstrated that his idea was well founded. The success of the material was such that Dr. Lux decided to devote the whole of his attention to the manufacture and distribution of the new purifying material, to which he gave the name "Lux." Within a year of this decision "Lux" had been successfully introduced into many gas-works in Germany, and it was not long before its merits were appreciated in other countries. Dr. Lux was well known to many members of the Institution of Gas Engineers, the annual meetings of which he frequently attended. His original firm, Frederick Lux, Ltd., ceased to exist at the end of 1928, and transferred all its interest to the new Company, Luxmasse, at Ludwigshafen on the Rhine, of which Dr. Lux was the Life Manager.

Forthcoming Engagements.

April 23.—Southern Association of Gas Engineers and Managers (Eastern District).—Meeting at 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.

April 26.—Western Junior Gas Association.—President's Day. Visit to the Weston-super-Mare Gas-Works, and Annual Meeting.

April 28.—Wales and Monmouthshire Junior Gas Association.—Annual General Meeting at Newport.

May 2.—North of England Gas Managers' Association.—Annual General Meeting in Newcastle.

May 2.—British Commercial Gas Association.—Scottish District Conference, Ayr.

May 9.—Southern Association of Gas Engineers and Managers.—Visit to Eastbourne.

May 9.—British Commercial Gas Association.—Midlands District Conference, Malvern.

May 13.—British Commercial Gas Association.—Executive Committee Meeting, London, 2.30 p.m.

May 15.—Midland Association of Gas Engineers and Managers.—Spring general meeting at Bromsgrove.

May 16.—Eastern Counties Gas Managers' Association.—Spring Meeting at Harwich.

May 16.—Society of British Gas Industries.—Annual General Meeting and Dinner, Hotel Metropole, London.

May 21.—British Commercial Gas Association.—General Committee Meeting, London, 2.30 p.m.

May 23.—British Commercial Gas Association.—Lancashire District Conference, Morecambe.

May 27.—National Gas Council.—Annual Meeting.

June 2-5.—Institution of Gas Engineers.—Annual Conference in Leeds.

Commercial and Industrial.

Stock Market Report.

[For Stock and Share List, see later page.]

The close proximity of the Budget statement had a somewhat restraining influence on Stock Exchange business last week; but most markets displayed an optimistic tone, and prices continued firm.

Gas stocks and shares received a fair measure of support; and it is worth noting that for the past few weeks prices have been steadily improving. British 7 p.ct. preference headed the list of increases with a rise of 6 points to 117½; and at this price the yield is £5 19s. 2d. The Imperial Continental capital stock was again much in demand, and gained a further 5 points to 400. This Company's 3¼ p.ct. debenture stock is now quoted at the high price of 80, and business was done at 85. Alliance and Dublin ordinary almost recovered the *ex* div. reduction of the previous week with a rise of 2 points to 93½. A parcel of this stock should make a good purchase. The Company has been steadily increasing its rate of dividend for the past four years—viz., 1926, 6⅜; 1927, 7; 1928 and 1929, 7⅝; and at the present price gives the high yield of £8 3s. 1d. The stock changed hands last year at 102. Commercial ordinary, after a brief period of inactivity, received some support, and the price gained a point to 90½. At intervals during the past two years transactions in this stock have been recorded at a little over par, and 6 p.ct. has been distributed since 1927, so that there would appear to be every justification for further improvement. The South Metropolitan and Tottenham ordinary stocks both hardened a point to 101½ and 103 respectively. Gas Light £1 units recorded a slight set-back of 3d. to 19s.

The Oriental Gas Company have declared an interim dividend of 3½ p.ct., payable May 31—the same rate as a year ago.

Coal Markets.

Gloomy reports from the markets reveal a continued absence of demand, and the cumulative effect of a long spell of this is that idle time is becoming frequent at some of the pits. The current week may see some slight improvement, owing to the Easter holidays and the normal curtailment of production, but prospects further ahead show no promise of better trade.

On the North-East Coast, the shortage of boats due to stormy weather added to the difficulties of the past week, and odd cargoes of coal changed hands at low figures. Gas coal demand is very slow, and the season certainly is not favourable to brisker business. Wear specials are still quoted at 16s. 9d. f.o.b., and bests at 16s. Best seconds are very easy, and, while nominally 13s. 9d. to 14s. 3d., some brands are obtainable down to 13s. 3d. f.o.b. Coking sorts, too, are freely offered. In Yorkshire, the demand both on home and export account is very disappointing. The official export price for screened gas remains at 15s. 9d. to 16s. 6d., but little business is passing.

More activity in gas coke for export is reported from the Newcastle market, but here, as elsewhere, the value remains at round about 21s.

Trade Notes.

Improvements at Coleraine.

The tender of Messrs. West's Gas Improvement Company, Ltd., Manchester, has been accepted by Coleraine Borough Council for the installation of vertical retorts, and for the foundations; also the tender of Messrs. R. & J. Dempster, Ltd., Manchester, for a new gasholder.

"T.I.C." Tar Plant for Newmarket

The Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., has received an order from the Newmarket Gas Company for a "T.I.C." tar treatment plant having a capacity of approximately 15 tons of crude vertical retort tar per 24 hours. This plant is for the production of road tars.

And for Dunoon.

In addition, the Woodall-Duckham Company has received an order from the Dunoon Town Council for a combined "T.I.C." tar treatment plant and bitumen melting and mixing plant. The plant will treat vertical retort tar and have a capacity of approximately 10 tons of crude tar per 24 hours.

Metrovick Self-Contained Turbo-Generators.

A recent publication by Metropolitan-Vickers Electrical Company, Ltd., of Trafford Park, Manchester, deals with the self-contained turbo-generating unit, originated and developed in 1927. The Company state that the design and performance of these sets have been so uniformly successful that orders for nearly 100 sets have been received up to the present from all parts of the world, many of them being repeat orders.

Protection for Services.

Messrs. Wailes Dove Bitumastic, Ltd., of Newcastle-on-Tyne, have just issued a folder devoted to the protection of services and other small-diameter pipes by a new and more economical method of applying "Bitumastic" enamel. While "Bitumastic" enamel is usually spread on large sized pipe by means of a brush, canvas sling, or special rolling rig, it has proved more economical and efficient to *dip* the small sized pipe directly into the molten enamel. The firm have, therefore, developed a system of dipping—utilizing plugs, tongs, and easily constructed dipping troughs—which is used with success by leading gas companies and which has made the protection of small diameter pipe as simple and as inexpensive in application as it is beneficial and long-lasting in results.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

London, *April* 14.

Prices of tar products remain unchanged.

Creosote for export is 6d. to 6¼d. per gallon f.o.b.

Pitch is 47s. 6d. per ton f.o.b.

Pure toluole is 2s. 5d. to 2s. 6d.; solvent naphtha, 95/160, about 1s. 5d.; pure benzole, about 1s. 11d.; and pyridine bases, 3s. 9d.—all per gallon.

Tar Products in the Provinces.

April 14.

The average prices of gas-works products during the week were: Gas-works tar, 21s. to 26s. Pitch—East Coast, 46s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid and salty, 3¼d. to 3¾d.; low gravity, 1¼d. to 1½d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 2s. 4d. to 2s. 5d. prompt. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum, 40 p.ct., purely nominal; "B" quality, unsaleable.

* It is proposed in future to quote all prices for pitch on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

Glasgow, *April* 12.

The market continues to be rather dull, and even refined tar, which should be active at this time of the year, is quiet. Prices of most products are steady.

Pitch.—The nominal value is unchanged at 47s. 6d. to 50s. per ton f.a.s. Glasgow for export, and 50s. per ton f.o.r. works for home trade.

Tar.—While quotations remain steady at 4d. to 4¼d. per gallon, the demand is spasmodic meantime.

Creosote.—Orders are scarce and prices remain easy. B.E.S.A. specification is 3½d. to 4d. per gallon; low gravity, 3d. to 3½d. per gallon; neutral oil, 3d. to 3½d. per gallon; all filled into buyers' tanks at makers' works.

Cresylic.—Quotations are well maintained. Pale 97/99 p.ct. is 1s. 8¾d. to 1s. 9¾d. per gallon; dark 97/99 p.ct., 1s. 7¼d. to 1s. 8¼d. per gallon; pale 99/100 p.ct., 1s. 11¼d. to 2s. 0¼d. per gallon—all f.o.r. works.

Crude Naphtha.—There is very little business passing at present, and the price is about 4¾d. to 5¼d. per gallon *ex* works.

Solvent naphtha is unchanged in value; 90/160 is 1s. 2¼d. to 1s. 3¼d. per gallon, and 90/190 is 1s. to 1s. 1d. per gallon.

Motor benzole is in good demand, and meantime some makers are unwilling to sell for forward delivery. To-day's value is about 1s. 6d. to 1s. 6¼d. per gallon f.o.r. makers' works.

Pyridines.—There is no change in prices; 90/160 grade being about 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole . . .	0 10 to	0 11	per gallon at works
Motor ,, . . .	1 5½ ,,	1 6½	,, ,,
Pure ,, . . .	1 10 ,,	1 11	,, ,,

Contracts Open.

Pipes.

The Pontypridd Urban District Council Gas Department invite tenders for the supply and delivey of steel mains and specials. [See advert. on p. 160.]

Retort Setting.

The Gas Committee of the Skipton Urban District Council invite tenders for the reconstruction of one through setting of eight retorts. [See advert. on p. 160.]

The Bakewell Urban District Council invite tenders for renewing and resetting retorts. [See advert. on p. 160.]

Structural Steelwork.

The Burnley Corporation invite tenders for the supply and erection of structural steelwork in the extension of an oxide revivifying shed. [See advert. on p. 160.]

In To-Day's "Journal."

North British Association of Gas Managers.

There is a full report of the Spring Meeting of the Association, held under the Presidency of Mr. David Fulton, at Helensburgh on Friday last. Part I. of the Presidential Address is published. Mr. Fulton has been Hon. Secretary of the Scottish District Advisory Committee of the Education Scheme since its inception in 1923. He expresses the opinion that it might have been better had the Institution made the course for the Higher Grade Certificates at least one year longer. But it was probably felt, he observes, that students would object to a longer period, and some sacrifice had to be made to secure their goodwill. Nevertheless the extra year would have been in the students' own interests. The first three years of the course leading up to the Ordinary Grade Certificate are in order. But the further period of two years leading up to the Higher Grade Certificates is overburdened. Accordingly there is the danger that the student, thinking of the examination in the principal subject, is inclined to do no more in the ancillary subjects than is sufficient to enable him to secure the number of marks required to qualify in the respective subjects. In Huxley's words: "They work to pass, not to know, and outraged Science takes her revenge. They do pass and they don't know." A sixth year in the course would, he suggests, have avoided this danger, and broadened the basis of the studies preliminary to intensive study of the principal subject. Further, the candidate's practical experience would have been greater, and he would have been better equipped for the examinations.

* * * *

Glover-West Verticals at Brno.

Ing. Dr. techn. Franz Perna contributes an article on the new installation of Glover-West retorts at the Municipal Gas and Electricity Works of Brno, Czechoslovakia. This installation represents the third time the Glover-West system has been chosen in Czechoslovakia. The other plants are at Plzen and Prague. In taking over the order, says Dr. Perna, the English Company guaranteed that, when carbonizing a large coal from the Nová Jáma or Bettina mines of the Ostrava coalfield containing 3·73 p.ct. moisture, 4·55 p.ct. ash, and 31·33 p.ct. organic volatiles, the maximum production of gas per retort per 24 hours would not be less than 1930 cub.m. (68,200 c.ft.), that the following minimum makes per 100 kg. of coal would be achieved: 40 cub.m. of gas with a calorific value of 4925 to 5000 kg.-calories per cub.m., measured dry at 0° C., 760 mm. hg. (14,350 c.ft. per ton at 516 to 524 B.Th.U. per c.ft. 60° Fahr., 30 in., hg. moist) 64·4 to 65 kg. of coke (64.·4 to 65 p.ct.) 5 to 5·5 kg. of tar (112 to 123 lbs. of tar per ton of coal). The fuel-consumption per 100 kg. of coal carbonized was not to exceed 13 kg. (13 p.ct.) when taking into account the coke carried away in the ashes, and not to exceed 14·6 kg. (14·6 p.ct.) when ignoring the coke in the ashes. The whole of the foregoing guarantees were not only achieved but considerably exceeded, and this not only during the tests but in the whole course of ordinary daily operation up to the present time.

Reconditioning of Gas Appliances.

The system in vogue in Edinburgh for the reconditioning of gas appliances is described by Mr. C. D. Blackhall, of the Corporation Gas Department. Geysers of all types are repaired in the workshops. Great care is taken to see that each geyser is absolutely tight, and examination is made to ascertain that the by-pass and burner are in good working order before assembling. In fitting geysers, Mr. Blackhall observes, it is always instructive and beneficial to the consumers to allow them to operate the geysers under the tuition of the gasfitters or plumbers. This obviates complaints and accidents. The consumer's attention should always be drawn to the instructions on the geysers. The plant in the workshops in Edinburgh consists of two gas engines, air compressor; sand-blast plant, drilling machine, two screwing machines, a mechanical saw, a high-speed buff and dolly for polishing, two gas ovens, a paint spraying plant for fires, and a large tank for washing tins, &c. It will thus be seen that everything for making a good job is at hand.

* * * *

Simultaneous Cooking of a Six-Course Dinner.

Last week a highly successful demonstration was staged at Radiation House of the simultaneous cooking of a six-course dinner in a "Regulo"-controlled "New World" cooker.

* * * *

Gas in Barnsley Council Houses.

After considering the action of the Barnsley Gas Company in installing gas in 181 houses on the Carlton Lane scheme, a Sub-Committee recommended, at a meeting of the Barnsley Town Council on April 8, that notice be given to the whole of the tenants of the houses where gas has been installed, terminating their tenancy, unless they give an undertaking to have such installation removed. Comment is made on this situation in our editorial columns.

* * * *

The Microstructure of Coal.

A review appears of Department of Scientific and Industrial Research, Fuel Research, Physical and Chemical Survey of the National Coal Resources No. 16, by Clarence A. Seyler and W. J. Edwards. H.M. Stationery Office; price 2s. 6d. net.

* * * *

Joint Gas Conference, B.I.F., 1931.

The Central Executive Board of the National Gas Council have agreed to ask Messrs. P. N. Langford, H. C. Smith, and W. W. Townsend to represent the Council on the Joint Gas Conference Committee at the British Industries Fair, Birmingham, next year. Mr. W. J. Sandeman and Mr. L. E. Clift have been asked to represent the Council on the Gas Industries Section Committee in connection with the 1931 Fair.

Correspondence.

[We are not responsible for opinions expressed by Correspondents.]

Oxide Purification.

Sir,—We have read Mr. H. R. Hill's letter in your last issue with much interest, and have pleasure in giving below the desired information.

(1) In some quarters the idea is still prevalent that the ferric oxide tri-hydrate ($Fe_2O_3.3H_2O$) is the active portion of purifying material, and consequently the moisture above that satisfying the above formula is called "free" moisture. Such differentiation is entirely arbitrary. It has been proved fairly conclusively that only the mono-hydrate ($Fe_2O_3.H_2O$) is identifiable and stable. It occurs in mineral oxides either in the crystalline or amorphous form, but it is certainly absent in precipitated artificial oxides and bog ores. Both these oxides probably contain the "active iron" in a colloidal state, which as a "gel" requires a certain amount of water to show the highest degree of reactivity.

The optimum moisture content for different oxides varies with the amount of iron which is chemically active, although the relationship is somewhat masked by the capillary and adsorbed water, which depends on the surface exposed by the material.

While a certain category of mineral and artificial oxides shows the greatest activity when almost dry, high-grade precipitated oxides and bog ores give the best results with what may seem a very high water content. As this varies with different materials, it is impossible to give a general figure, but every attempt should be made to prevent dehydration of the oxide inside the purifiers, lest the efficiency of the process be impaired.

(2) For discharging purifiers a fire engine is quite unsuitable, but a foreman and a good gang of men usually find no difficulty in performing the task. When the spent material contains 50 p.ct. of sulphur, which is present in the molecular state, it cannot be regarded as a "freshly fouled box." The concentration of iron sulphide is much reduced, and the oxidation on exposure to air is not violent. Indeed, the material is spent, and does not warrant its re-use in the purifiers. Hence the necessity for revivification is obviated, although it is not prevented. For a time the spent material is left on the floor in the condition in which it has been removed from the box, before it is despatched to the acid works.

E. George Hutchinson.

Messrs. Thomas Duxbury & Co.,
Palace Chambers,
Westminster, S.W. 1.
April 14, 1930.

Topical Items.

The "North British" on the Links.

The pleasure of a day's golf with the North British Association during their General Meeting in the autumn is never marred by an excess of formality; and so popular has the fixture been that last year it was decided to arrange a "sub-formal" competition to coincide with the Association's Spring Meeting. It took place over the Helensburgh Course last Thursday, and the Chairman of the Golf Circle (Mr. George Keillor), the Hon. Secretary (Mr. J. O. Scott), and Mr. David Fulton had the satisfaction of seeing as many as 33 cards taken out in a round against Bogey. Whether they all came back again was not revealed in the subsequent proceedings; but we can record the fact that a disused quarry on the links contained no litter beyond a few divots. In any case the weather, the situation of the links, and the general arrangement of the meeting were such as to make the quality of the golf a minor consideration.

Mr. George Keillor (Greenock) carried off the Scratch Prize with a score of 86 in conditions none too easy; and the handicap prize winners were as follows:

1.	G. A. Mitchell (Glasgow)	78
2.	R. M. Cairns (Glasgow)	79
3.	H. A. Dobbie (Glasgow)	80
4.	L. Gardner (Lenzie)	81
5.	A. B. Bradley (London)	82
6.	R. L. Laing (Brechin) / John Lang (Alexandria) / Allan Young (Edinburgh)	

The prizes were presented by Mr. David Fulton at the request of Mr. Keillor; and they and Mr. Scott took the opportunity of urging a record attendance at the Aberdeen Meeting on Sept. 10, 11, and 12. It is hoped that the magnificent course at Balgownie will be available for the members; and none should miss the opportunity.

Scottish Eastern Juniors Visit Perth.

On April 5, members of the Scottish Junior Gas Association (Eastern District) visited Perth. At the gas-works they were welcomed by Mr. David Vass, the Engineer and Manager, who, along with Mr. A. R. Wilson, his Chief Assistant, and other members of the staff, conducted the party round the works.

The gas-works at Friarton are situated on the banks of the River Tay, and occupy an area of about 4½ acres on sloping ground between the Tay and the Edinburgh Road.

A horizontal retort house 194 ft. long and 66 ft. 3 in. span was designed to take two benches of seven ovens each, set with eight through retorts, machine charged. There was a separate chimney at each end of the house. The capacity of the two benches was 1½ millions. In 1922, three of the original ovens and one chimney were taken down, thus clearing a space of 50 ft. by 66 ft. 3 in. The roof was removed and the walls raised, and a new roof 70 ft. by 50 ft. constructed with ridge at right-angles to former ridge. A bench of five ovens of Glover-West vertical retorts was built in this space, four of the ovens being completed with eight fireclay retorts each, while the fifth oven was later filled in with silica retorts. The ground space of the five vertical ovens is approximately one-fourth of that occupied by the horizontal benches, with a greater output of gas.

There is one gasholder on the works, erected quite recently, of a capacity of 1¼ million c.ft. This holder and the other two holders and governors at the Shore Station were fully described in a paper by Mr. Alan McG. Clark, in 1926. [See "Journal," Vol. 174, p. 223.]

The sulphate of ammonia plant is after the design of the late Mr. A. Gillespie, of Glasgow, and neutral salt is produced by addition of carbonate of ammonia.

The tar works are situated on the higher ground and consist of a Wikner plant for removal of greater portion of water from of tar before running into the pot still.

There are two stills each of five tons capacity, and distillation is regulated by temperature records, allowing various grades of Road Board tar to be prepared; or distillation to pitch can be carried out according to market demands. There is also a Wilton bitumen mixing plant for the preparation of the different grades of bitumen mixtures required for road purposes.

On completion of the visit the visitors were conveyed to York House, where Bailie James Stewart, Convener of the Gas Committee, welcomed the party at tea. Thereafter three papers were read, one of which, by Mr. C. D. Blackhall, of Edinburgh, will be found on later pages to-day. The papers by Mr. J. M. Dow, of Perth, and by Mr. William Scott, of Alloa, will be published in the "Journal" next week.

Mr. Scobie, President of the Association, expressed thanks to Convener Stewart, Mr. Vass, and the Gas Committee, for the welcome and hospitality extended.

Evening Star Chapter, No. 1719.

Installation Convocation.

The Installation Convocation of the Evening Star Chapter, No. 1719, for the year 1930-31 was held at Freemasons' Hall, Great Queen Street, London, on Wednesday, April 9, presided over, at the commencement of the proceedings, by Ex-Comp. Walter McDowell, as M.E.Z.; Ex-Comp. W. W. Hammond as H.; and Ex-Comp. Frank West as J.

Ex-Comp. Arthur E. Eves, L.C.R., was unanimously elected Treasurer in succession to Ex-Comp. William A. Surridge, P.P.St.B., who served in that capacity from the date of the consecration of the Chaper. A cordial vote of thanks was passed to him for his signal services.

The following officers were invested for service during the year 1930-31:

M.E.Z.	Ex-Comp. W. W. Hammond
H.	,, Frank West
J.	,, Ralph Carr
Scribe E.	,, Alfred C. Beal, P.Z.
Scribe N.	Comp. John R. Masters
P.S.	,, G. D. Bidwell
1st Assistant Secretary	,, A. R. Barford
2nd ,, ,,	,, John A. Brentnall
Director of Ceremonies	Ex-Comp. Charles Clare, P.Z.
Organist	,, Walter T. Dunn, P.Z., 2913
Stewards	Comp. A. B. Potterton / ,, T. F. C. Potterton
Janitor	Ex-Comp. R. H. Goddard

Gas in Barnsley Council Houses.

Proposal to Eject 181 Tenants.

After considering the action of the Barnsley Gas Company in installing gas in 181 houses on the Carlton Lane scheme, a Sub-Committee recommended, at a meeting of the Barnsley Town Council on April 8, that notice be given to the whole of the tenants of the houses where gas has been installed, terminating their tenancy, unless they give an undertaking to have such installation removed.

Alderman G. W. Simpson said that the Gas Company went into Council houses and continued to trespass; indeed, they challenged the Council. The time had arrived when they should tackle the Gas Company, but he was sorry to see that the Committee were about to tackle the tenants. He declared that the Gas Company had beguiled the tenants by telling them that they had permission to instal gas in the houses. He was not going to be a party to turning 181 people into the street, and he moved the reference back of the minute. The issue was between the Council and the Gas Company.

Supporting the reference back, Councillor J. Jones said they were placing the tenants in an invidious position. Some of them might not be aware of the legal position.

Councillor J. G. E. Rideal said that when the tenants took the houses there was no agreement regarding gas.

Fair Competition.

Mr. H. M. Walker asked whether it was to be the policy of the Committee not to allow their tenants to use gas. "Why should we not come into the field in fair competition with gas? We cannot dictate to 181 tenants as to where they should buy their shirts, and we ought not to interfere in their private affairs like this. I ask whether we really are asked to support a tyrannical policy?"

Alderman Herbert Smith said the tyrannical policy was the minute to evict 181 tenants. It was not a question of gas *v.* electricity; it was a question of putting the responsibility on the proper shoulders.

Councillor R. J. Plummer pointed out that an Act of Parliament provided that gas could be installed into a house by permission of the landlord or tenant, and said there were some better means of adjusting the matter than by turning out the tenants.

Alderman Cassells said there were property owners in Barnsley, Directors of the Gas Company, who would not allow tenants to have electricity in their houses. The Gas Company had a right to ask the owners' permission before they trespassed on Council property.

Suggested Solution.

Councillor H. Potter said the matter would be solved if they went into the question of allowing tenants to use gas for heating purposes.

Alderman G. Mason (Chairman of the Highways and Housing Committee) said the Corporation had never received an application from the Gas Company to instal gas in Council houses. "There is no desire to turn anyone out but we must come to finality," he observed.

He agreed to take the minute back.

Continuous Coal Carbonization.

Continuous Coal Carbonization, Ltd., have issued a progress report stating that work in connection with obtaining foreign and colonial patents in respect of the Company's straight-line continuous retort has proceeded satisfactorily, and patents have been granted for France and Spain. The Canadian patent has been accepted and is now ready for issue.

The Company has concluded an arrangement by which it has acquired a 25 p.ct. interest in the world's rights of a process for the manufacture of a new bituminous concrete known as "Larvite," suitable for road and building materials. The bituminous bye-products from the distillation of coal can be used in connection with this process, and it is stated that this will enable the Company to find a ready market for its own bituminous bye-products.

Smoke Abatement in Scotland.

That public opinion is now awakening to the importance of securing a purer atmosphere in the interest of public health and prosperity is expressed in the annual report of the Scottish Branch of the National Smoke Abatement Society. Under the auspices of Mr. Harris, the Glasgow Corporation Chemist, a commencement has been made with observations on the amount of ultra-violet rays reaching the city. These records, it is held, will become useful indices of the effect of a smoky atmosphere. According to the report, the amount of ultra-violet radiation recorded during the winter months has been very small. While admitting that the more general use of smokeless fuel is largely the reason for the change in the atmosphere, the Society contend that their activities have assisted to bring about a reduction in the smoke output.

The classes conducted by the Society for firemen show an increase in the numbers attending. The enrolments in the advanced class numbered 15 and in the ordinary class 95, which figures are indicative to the Society of the interest now being taken by manufacturers and public bodies in training their employees in the economical use of fuel. In the 14 years during which the classes for firemen have been in operation 1057 men have enrolled. The report concludes with an appeal for more public support for the Scottish branch.

The annual meeting and conference of the branch will be held in the Town Hall, Coatbridge, on May 9 next, when various aspects of the smoke problem will be discussed.

Dundee Gasfitters' Wages.

A move towards the reduction of the wages of gasfitters employed by Dundee Corporation was made at a recent meeting of the Gas Committee. At present the gasfitters are paid 1s. 7½d. per hour, which, we understand, is 3½d. more than the rate paid in Aberdeen, Edinburgh, and Greenock. The Committee agreed to recommend that steps be taken whereby the Corporation will be enabled gradually to reduce these wages to the basic rate of 1s. 4d.; 107 men will be affected by the reduction.

In February it was agreed to take ½d. per hour off the gasfitters' and sheet metal workers' wages, but this reduction was made in ignorance of an existing local agreement, by which one month's notice has to be given; and it was agreed to repay the amount of the reduction to the men affected.

Mr. David Latto, Town Clerk Depute, reporting on behalf of a Sub-Committee which had investigated the whole question of wages, said that the gasfitters and sheet metal workers in the gas-works were paid at the rate of 1s. 7½d. per hour, while in Aberdeen, Edinburgh, and Greenock the rate was 1s. 4d. per hour. This difference seemed to have arisen through the fact that there was an agreement between Dundee Master Sheet Metal Workers' and Gasfitters' Association and the men's union, whereas the wages paid by other corporations were governed by the Joint Industrial Council of the Gas Industry.

After dealing with the recommendation to repay the reduction which had been made in error, Mr. Latto said it was recommended that the Council should withdraw from the membership of the local Association by giving the usual month's notice, so as to enable themselves gradually to reduce the wages of the workmen in question from 1s. 7½d. per hour to 1s. 4d., the present basic rate.

The Standing Orders prescribed that the Corporation should pay the standard rate of wages ruling in the district, but it was recommended that this Standing Order should be amended with regard to the employees in the gas-works, so as to bring them under the regulations of the Joint Industrial Council for the Gas Industry, which meant that their wages would in future be guided by that Council.

It was further recommended that this amendment of the Standing Order should not come into operation until the Corporation had severed its connection with the local Master Sheet Metal Workers' and Gasfitters' Association, and reduced the wages to the basic rate of 1s. 4d.

Convener A. A. Leslie moved approval of the Sub-Committee's recommendations, and Bailie William Reid seconded. The recommendations were accordingly carried.

Oriental Gas Company, Ltd.—The Directors have resolved to pay, on May 31, an interim dividend at the usual rate of 3½ p.ct., *less* income-tax, on account of the year ending on June 30 next.

Sale of Stock at Plymouth.—At a sale by auction at Plymouth on Thursday, April 10, £300 worth of ordinary stock of the Plymouth and Stonehouse Gas Light and Coke Company (last dividend 8 p.ct.), was sold at £116 per £100; and £400 worth of the same stock made £116 15s. per £100.

Burnley Trades Exhibition.—An exhibition organized by the Burnley and District Chamber of Trade was concluded on March 19, and proved highly successful. It is estimated that 25,000 people visited the exhibition during its week's run. The Burnley Gas Department were awarded third place in a "Four Best Stands Competition."

Gas Exhibition at Hereford.—The use of gas in modern methods of cooking is being demonstrated by the Hereford Gas Department. The Mayor of Hereford (Mrs. Luard, M.B.E.) opened the Exhibition, and there have been large audiences at the demonstrations which have been conducted by Miss H. Whitfield, of Radiation Ltd.

"B.C.G.A." Salesmen's Circle Visit Mantle Factory.—On Saturday morning, April 12, the Manchester District—West Riding of Yorkshire Section—Gas Salesmen's Circle, visited the Veritas Incandescent Mantle Factory, Wandsworth. The President, Mr. A. Wylie, was a member of the party whose visit was organized by the Hon. Secretary, Mr. H. Wilde. Subsequently the party witnessed the Boat Race.

East Hull Stock Issue.—As will be seen from our advertisement columns, A. & W. Richards, of 37, Walbrook, E.C. 4, are offering for sale by tender, on behalf of the Directors of the East Hull Gas Company, £20,920 5½ p.ct. redeemable debenture stock, at a minimum price of issue of par, to be redeemed at par on July 1, 1955. The minimum amount of stock which may be tendered for, or will be allotted, is £25. Above this, tenders may be in amounts or multiples of £5. Applications for this issue must be received not later than 11 o'clock a.m. on Tuesday, April 29.

Sensible Heat Distillation Fatality.—While working on the coal carbonizing plant of the Sensible Heat Distillation Company, at Barugh, near Barnsley, Arthur Foster (35), a boiler hand, was overcome by fumes and fell into a hopper which he was feeding. A fellow-worker, Charles Tune, in attempting a rescue, was also overcome and was removed to hospital in an unconscious condition. A verdict of "Death by misadventure" was returned, and Tune was complimented on his heroic attempt to rescue his colleague. The inspector recommended placing bars across the opening to the hopper.

Bombay Gas Company Report.—The revenue account of the Bombay Gas Company, Ltd., shows a profit for the year of £23,440, which sum added to the profit on exchange £5530, and the balance of £37,388 brought forward from the previous year, amounts to £66,360. After providing for the payment of interest and the interim dividend paid in November last and writing off the suspense account, there remains a balance of £48,993, out of which the Directors recommend the payment of a dividend of 4 p.ct. (*less* income-tax), making 7½ p.ct. for the year, which will leave £36,993 to be carried forward to the current year.

British Thomson-Houston Company Visited by Duke of York.—On Tuesday afternoon, April 8, H.R.H. the Duke of York visited the Rugby Works of the British Thomson-Houston Company, Ltd., as President of the Industrial Welfare Society. He was accompanied by the Rev. Robert R. Hyde, Director of the Society. After being received by Mr. W. C. Lusk (Chairman of the British Thomson-Houston Company) and Mr. G. M. Campbell, Mr. F. Fraser, Mr. J. L. Wilson, Directors, and Mr. A. P. Young, Manager of the Works, the Duke commenced a tour which included the "Mazda" electric lamp works, fabrication department, motor factory, turbine department, power transformer factory, electrical machine shop, the foundry, ambulance station, &c. A feature of the tour was the presentation to His Royal Highness of employees with long service, there being quite a number who have been with the Company for over a quarter of a century. At the present time there are approximately 7000 employees of the British Thomson-Houston Company at the Rugby Works, about 70 p.ct. of this number being actually engaged in the factories.

National Gas Council.

Meeting of Central Executive Board.

The Central Executive Board of the National Gas Council met on Tuesday, April 8, at 28, Grosvenor Gardens, S.W. In the absence of the Chairman (Sir David Milne-Watson, D.L., LL.D.), the chair was taken by Mr. William Cash, F.C.A., J.P. (Vice-Chairman).

The Late Mr. Norman S. Cox.

Before proceeding with the agenda, the Chairman referred to the great loss sustained by the Central Executive Board, and by the industry generally, in the death of Mr. Norman S. Cox, Director and Secretary of the Sunderland Gas Company. Mr. Cox was one of the original members of the Board, and took a very active part in the work of the Council, both on the Central Executive Board and as Chairman of the Northern District Executive Board. His loss would be felt very keenly by his many friends throughout the industry. A vote of sympathy with his relatives was passed, all standing.

The draft annual report of the Council, having been circulated, was amended and approved.

The progress of the Bill was reported, and mention was made of the deletion of the clause which provided for the imposition of levies for the purpose of subsidizing those districts which were largely engaged in the export trade. It was hoped that the Bill would be amended still further in the House of Lords.

Committee on Gas Poisoning.

It was reported that a conference, convened by the Board of Trade, had taken place on April 3 at the Board of Trade, of representatives of the National Gas Council, the Institution of Gas Engineers, the Society of British Gas Industries, and the Gas Companies' Protection Association, to discuss the best means of carrying into effect the recommendations contained in the report of the Departmental Committee.

Pending the presentation to the Central Executive Board of a report by the Gas Safety Committee of the Council with regard to the recommendations of the Departmental Committee, the Gas Safety Committee were authorized to have a communication sent to all members of the Council, asking them to facilitate the preparation of an accurate statistical record, by providing the Board of Trade with information in the case of every death attributable to coal gas poisoning, on the lines indicated by the Board of Trade.

Joint Gas Conference—B.I.F., 1931.

A letter was reported from Mr. H. C. Smith, Hon. Secretary of the Joint Gas Conference, enclosing a resolution passed by the Joint Gas Conference Committee on March 12, "that in the opinion of the Committee, the holding of the 1930 Joint Gas Conference had been fully justified; that this conference was essential to the success of the Gas Industries Section; and that a similar conference should be organized in connection with the British Industries Fair, 1931." The letter contained a request that the Council would appoint three representatives at an early date, should the Council decide to support the conference in 1931.

It was agreed to ask Messrs. P. N. Langford, H. C. Smith, and W. W. Townsend, who were the Council's representatives on the previous Joint Gas Conference, to serve again in this capacity.

A letter was also read from Mr. R. J. Rogers, Hon. Secretary of the Gas Industries Section of the British Industries Fair, enclosing a resolution passed by the Gas Industries Section Committee on March 12, "that this Committee is convinced that the gas industry as a whole has definitely benefited by participation as a properly organized Section in the British Industries Fair, and recommends that every effort be made to assure a continuance of the Section at the 1931 Fair. And that Mr. R. J. Rogers is hereby instructed to write to the Institution of Gas Engineers, the Society of British Gas Industries, the British Commercial Gas Association, and the National Gas Council informing them of this recommendation, to the end that a representative Committee be appointed forthwith to take over all arrangements for a Gas Industries Section at the 1931 Fair."

The Board agreed that Mr. W. J. Sandeman and Mr. L. E. Clift, who had previously represented the Council, should be asked to serve again, and the Council's representatives on both the above-mentioned Committees were thanked for their services in connection with the British Industries Fair, 1930.

"The Microscopical Examination of Coal."*

In 1925 the Department of Scientific and Industrial Research published Technical Paper No. 11 of the Fuel Research Board ("The Microstructure of a Coal Seam"), describing the well-known work and portraying some of the magnificent coal sections prepared by the master hand of Mr. James Lomax.

The preparation of these transparent coal sections for the microscopic study of the structure of coal is a laborious and often heart-breaking job to the initiate, but when some measure of success is achieved the results well repay the trouble and energy expended on them.

It has now been fully recognized that the application of the numerous types of coal to the purposes for which they are most suited entails a knowledge of their different chemical and physical properties, a full understanding of which depends upon the elucidation of the constitution of coal. One of the important and a most absorbing means towards this elucidation is by microscopical examination for the determination of the botanical nature of the original material and the nature of the changes which accompanied its transformation into coal.

The present report describing the work of Mr. C. A. Seyler and his assistant (carried out during the past few years, with financial assistance from the Department) is a most valuable contribution to this subject, and may be looked upon as complementary to the previous report. The authors give a concise account of the method of preparing the thin sections of coal for examination by transmitted light (the modified technique of Dr. Thiessen's procedure is described), but the report is chiefly concerned with the more novel method of polishing and etching flat surfaces of coal. This method, originally applied to coal by Dr. H. Winter ("Fuel in Science and Practice," April, 1923), is based on metallographic practice, and by its aid plant structures in coal have been shown to be far more numerous than was previously supposed. It may be remarked here that it was owing to this method of examination that the vitrain of Dr. Marie Stopes, which for several years was considered to be completely devoid of structure, was found to contain definite plant structures invisible in the transparent sections.

There is the further advantage in this method that sections can be prepared in three determined planes meeting at right-angles in a selected part of a plant fragment, an essential to the interpretation of the complete structure of botanical specimens.

The method of grinding, polishing, and etching of the surfaces and of the mounting of the specimens for examination are very lucidly described, and one cannot help realizing that the procedure is considerably less laborious than that involved in the preparation of the transparent sections, though something is probably lost in not obtaining the attractive natural colouring of the specimens as observed by transmitted light.

The report also includes a description of a simple photomicrographic apparatus, with manipulative details, particularly for the photography of polished surfaces by vertical illumination but adapted also for the photography of thin sections by transmitted light.

An attractive feature of the 17 plates (consisting of 83 illustrations) at the end of the report is the reproduction of several photographs of models prepared by pasting on to a cube of wood, the photographs of the sections prepared in three planes meeting at right-angles, so illustrating the natural solid effect referred to above.

The account given of the cell structures found in coal, of their various states of preservation, and of the identification of definite plant structures is interesting as well as highly instructive, and the comprehensiveness of the treatise may be judged from the fact that the sections illustrated range from woods through lignites and the bituminous coals to the anthracites.

Finally, the six pages of glossary and a fairly complete bibliography of references at the end of the report deserve mention as in themselves a very useful contribution to the subject.

The combined excellence of the material and reproduction of this booklet, and the astonishingly moderate price at which it has been published, may well warrant the prophecy that it is destined to become a classic to those of us who are attracted to the study of the micropetrology of coal as a diversion from its industrial application.

"Tambt."

* Department of Scientific and Industrial Research, Fuel Research, Physical and Chemical Survey of the National Coal Resources No. 16. By Clarence A. Seyler and W. J. Edwards. H.M. Stationery Office, Adastral House, Kingsway, W.C. 2; 1929; pp. VI. + 67 and 17 plates; 2s. 6d. net.

North British Association of Gas Managers.

Spring Meeting at Helensburgh.

The Spring Meeting of the North British Association of Gas Managers was held in the Victoria Hall, Helensburgh, on Friday, April 11. Mr. DAVID FULTON, Helensburgh, the President of the Association, occupied the chair, and was accompanied to the platform by Provost R. R. Herbertson and members and officials of the Town Council of Helensburgh. The platform party also included Past-Presidents of the Association and some of the present Office-bearers.

A CIVIC WELCOME.

Provost HERBERTSON said that some time ago he asked the Chairman what he should say to the members of the Association, and the reply he got was this: "All you have got to say is a word or two of welcome, and make them feel at home." No words of his were necessary to welcome the present company to Helensburgh. They were not a little proud of the fact that the President of the Association this year was the Gas Manager of Helensburgh, and he was sure that in the days to come the choice would not be regretted. He was aware that some people looked on conferences with none too friendly an eye, but quite apart from the benefit to be derived from technical discussions he thought it was of decided advantage that they should meet, and comment on their difficulties and problems. He did not really think the public generally realized the importance of the gas industry from the national point of view. He himself had been somewhat surprised to read recently that there were over nine million consumers in Great Britain. The gas industry had great and grave responsibilities, but it seemed to him that part of the success achieved in the past must be laid to the credit of the North British Association and kindred societies.

The PRESIDENT said that the members of the Association were grateful to Provost Herbertson for attending the conference and extending to them a hearty civic welcome. If any of the members did not feel at home in Helensburgh, then he feared it was their own fault. When he was elected President of the Association he suggested to the members of his Town Council that he would like to have a meeting in Helensburgh. The Council took the matter up with great heartiness, and he was given this assurance: "Be quite sure, Fulton, we will not let you down."

At this stage of the proceedings Provost Herbertson withdrew.

OBITUARY.

The PRESIDENT said it was his painful duty to make reference to the death of three members of the Association—namely, Messrs. D. Easson (Selkirk), Smith (Glasgow), and J. Letham (Leslie). Mr. Smith, of Glasgow, was a gentleman of a gentle disposition. He was a kindly soul and one of the most upright men one could be associated with. Personally he looked back with pleasure to his early days in Glasgow and to the many kindnesses he had received from Mr. Smith. Although operating in more restricted spheres, the late Messrs. Easson and Letham had also done conscientious service for the industry.

PRESIDENTIAL ADDRESS.

The President at this stage delivered his Address, which will be found on later pages.

Mr. H. G. RITCHIE (Falkirk) said it was his pleasant duty to propose a vote of thanks to the President. Mr. Fulton was, as most of them knew, the father of the present Council, of which he became a member in 1918, his term as Hon. Secretary and Treasurer keeping him in active service longer than was usually the case. He thought Mr. Fulton was to be specially commended for his work in connection with the Education Scheme, and his remarks on that subject in the Address would be read by all interested in the welfare of the industry. He was glad to notice that in the opening part of the Address the President called attention to the possible danger of trusting to corporate action by corporate organization to keep the gas industry in the forefront. Individually they must all do their share. They now knew the worst that could happen through the operation of the Coal Mines Bill. Like Mr. Fulton they all deplored that a basic industry such as coal mining should be a pawn in the game of party politics, but they might congratulate themselves that the pessimistic views expressed in different quarters that the price of coal would be increased by at least 2s. 6d. per ton had not materialized. Such views might have been an incentive to coalmasters to ask for such an increase. He was surprised to hear Mr. Fulton's remarks on the Gas Regulation Act, 1920, especially that sentence where he referred to municipal undertakings operating under the therm system without the appointment of an independent gas examiner. At Falkirk they had always a gas examiner, and, of course, carried on with the same man when they came under the Gas Regulation Act. The fact of having such an examiner was a benefit, as it kept the regular "grouser" from commenting about bad gas when he knew that an independent man was testing against the gas undertaking. Like those non-statutory gas companies who had not yet been roped into adopting the Gas Regulation Act, Mr. Fulton had also much to be thankful for in only having to face opposition from electricity since 1925. He (the speaker) saw no reason why municipal undertakings in Scotland could not charge under a two-part or three-part tariff to meet electrical opposition, should they consider it advisable. Most of these undertakings were working under the Burgh Gas Supply Act, and the clause in that Act ordaining a consumer "to be charged in a like manner" was incorporated in private Acts. Mr. Fulton and the Helensburgh Corporation Gas Department were to be congratulated on the increased output of gas during the past ten years, but more so on the substantial increase in the consumption per consumer, which showed the energy and business capacity of their Engineer.

Mr. T. W. HARPER (Ayr), in seconding the vote of thanks, said they had listened to an Address that morning which bore the hallmark of a gentleman who had been in close touch with the affairs of the gas industry for a considerable number of years. At the present time Mr. Fulton occupied a unique position in the management of the affairs of the North British Association of Gas Managers. He questioned very much if there was a member of the Association to-day who had been in closer touch with the policy of the Scottish gas undertakings during the past ten years. In 1921 Mr. Fulton took up the heavy task of Secretary of the Association, and in the years that followed a vast amount of work was carried through. Later on he shouldered the Secretarial work in connection with the Education Scheme. It went without saying that the work of building up and carrying out a scheme was a most exacting one, and with all due respect to others there was no doubt that the heavier share of the burden fell upon Mr. Fulton. The President had raised the question of coke disposal, but, speaking from his own experience, he (Mr. Harper) found that there was an ever-increasing demand for coke as a domestic fuel. This was an outlet that could be increased if they made up their

THE PRESIDENT.

DAVID FULTON, Helensburgh.

Mr. Fulton was educated at Kelvinside School, Glasgow, and the Glasgow Royal Technical College. He entered the service of the Glasgow Corporation Gas Department, Dawsholm Works, in 1904. In the year 1912, he was appointed Assistant Engineer and Manager to the Helensburgh Gas Department, and three years later became Engineer and Manager. During the session 1915-16, Mr. Fulton was President of the Scottish Junior Gas Association (Western District). From 1920-28 he was Hon. Secretary of the North British Association of Gas Managers, while he has been a member of the Gas Education Committee of the Institution of Gas Engineers since 1927.

minds to produce suitable coke. It must be well-graded, and properly cleaned, and, what was more important, produced from a blend of coals which would result in a smokeless fuel with a minimum ash content and having free burning qualities. They heard a great deal regarding the quality of low-temperature coke, but he was certain that they in the gas industry could produce a solid fuel equal to any smokeless fuel produced from any low-temperature carbonizing plant. This could be done by any progressive undertaking. Another problem mentioned in the Presidential Address was the lighting load. At the present stage they were assailed with all manner of charges of slackness in regard to this load. In his own area of supply in the town of Ayr they had had competition from electricity for the past 45 years, and yet when they looked into the number of consumers who still used gas for lighting, they had a figure well over 50 p.ct. This gave a fair indication of the type of locality he meant. Ayr was a semi-industrial district. One-half of the population were working-class people, and the other half were what they might call purely residential, of the better-class type. It therefore went without saying that the charge of slackness laid against the industry in regard to its lighting load was a very unfair one. He agreed with the President that they had to talk about the lighting load, and to instal the very best class of fittings, and to maintain them in the most efficient state. Another interesting point in the President's Address related to central heating by gas. He agreed with Mr. Fulton that here was a big field for consumption. He was confident that consumers would be prepared to pay an extra sum for the cost of gas for central heating purposes, owing to its convenience and reliability. He had a case put up to him some time ago on the question of converting a coal-fired central heating boiler to gas, but, on looking into the type of boiler, he found it was hopeless. It was obsolete, and its efficiency was very poor. The big drawback to central heating by gas was the high capital cost of a well-designed boiler having a high efficiency. This was a problem for the manufacturer of gas boilers. Proceeding, Mr. Harper said he was very interested in the list of figures given for gas consumption under the various heads. Helensburgh stood as having the highest average consumption for consumers in Scotland, which reflected great credit on the management of the Helensburgh undertaking. He found, on looking up his own figures on the same basis, that the figures for consumption per consumer were comparable up to a point. The details were as follows:

Scale of Consumption. C.Ft. per Annum.	Number of Consumers.	Total Consumption.	Average per Consumer.
Under 5,000	269	780,200	2,800
Over 5,000 and under 10,000	360	2,685,800	7,461
,, 10,000 ,, ,, 20,000	883	13,475,200	15,261
,, 20,000 ,, ,, 30,000	594	16,432,000	27,664
,, 30,000 ,, ,, 50,000	502	19,044,200	37,976
,, 50,000 ,, ,, 75,000	156	9,338,000	59,860
,, 75,000 ,, ,, 100,000	44	3,889,800	88,404
,, 100,000 ,, ,, 150,000	27	3,226,000	119,500
,, 150,000 ,, ,, 200,000	28	5,216,200	186,300
,, 200,000 ,, ,, 300,000	6	1,588,000	264,666
,, 300,000 ,, ,, 400,000	8	2,864,400	358,050
,, 400,000 ,, ,, 500,000	6	2,693,800	448,966
,, 500,000 ,, ,, 600,000	3	1,663,000	554,344
,, 600,000 ,, ,, 700,000	3	1,890,600	630,200
,, 700,000 ,, ,, 800,000	1	740,800	740,800
,, 800,000 ,, ,, 900,000	2	1,716,600	858,300
,, 900,000 ,, ,, 1,000,000	2	4,613,600	2,306,800

Ayr, in relation to Helensburgh, had a larger number of consumers on the lower average and a smaller number of consumers on the higher average. This would indicate up to a point the ability of the consumer to pay for a service such as gas. It would appear that a town having a large proportion of well-to-do consumers would have an average consumption which would tend to rise, against a town having a class of consumer which was less well-to-do. There was the other point, of course—that Helensburgh had not felt the burden of competition until recent years, and, as the President had said, this high figure for consumption had been largely built up by the introduction of gas fires.

The President thanked Messrs. Ritchie and Harper for the kind things they had said about his Address. He remarked that flattery was the national language of friendship. Whoever saw a book or a man worth praising that was not as well worth abusing? And he rather regretted the convention which prevented the discussion of presidential addresses, as he felt there was much in the address worth abusing. Indeed, he would be very disappointed if it were not so. He remembered the words of J. M. Barrie—"The praise of our friends does not make us vain, but humble rather."

The Annual Meeting.

The President announced at this stage that the Council had decided to hold the annual meeting of the Association in Aberdeen on Sept. 10, 11, and 12. It was now a matter of eighteen years, said the President, since the North British Association had a conference in Aberdeen, and the Council and he himself felt sure that the members would prefer now to re-visit that very pleasant and delightful city.

Nominations.

The following gentlemen were nominated for vacancies in the Council—Mr. J. A. Frazer, Dalmarnock, Glasgow; Mr. H. A. Aitken, Leven; Mr. W. A. Dearden, Johnstone; Mr. S. Dickie, Dumfries; Mr. J. Dickson, Kirkintilloch; and Mr. R. S. Sturrock, Ardrossan.

This concluded the business of the meeting, and the members afterwards adjourned to the luncheon hall.

The Luncheon.

An enjoyable part of the proceedings was the luncheon which was held in the Victoria Hall. At this function, which was attended by a large and representative company, the members of the Association were the guests of the Provost, Magistrates, and Town Council of the Burgh of Helensburgh. Provost R. R. Herbertson presided, and with him at the head of the table were Mr. James Walker, M.P., Newport (Mon.); Mr. David Fulton, and Mr. J. W. M'Lusky, City Gas Engineer, Glasgow.

The usual Loyal Toast having been given from the Chair,

Mr. James Walker, M.P., proposed "The Gas Industry." He explained that his interest in the gas industry of the country might be said to cover a period of something like seventeen years, and went back to the time when he was a member of the Gas Committee of the Glasgow Corporation. That forenoon in Helensburgh he had listened to a very interesting and thought-provoking address from the President of the Association. So far as developing the gas industry of the country was concerned, he supposed the President belonged to that school of thought which would like to retain the old idea of individualism so far as it was possible to do so, but there was no doubt at all that the principle foreshadowed in the Coal Mines Bill of co-operation and co-ordination had to be developed. If it was thought to be in the national interest, the same idea as that embodied in the Coal Mines Bill would have to be introduced in relation to the gas industry. Indeed, he could foresee a time when there would possibly be a Gas Board, just as there was an Electricity Board. He was not one of those who believed that electricity was going to wipe out the gas industry. Indeed, it seemed to him that there was a tremendous future for gas so far as heating and industrial purposes were concerned.

The President, with whose name the toast was coupled, said he did feel it was somewhat presumptuous on his part to endeavour to respond to the toast of "The Gas Industry." He felt inclined to limit the toast to that of "The North British Association of Gas Managers," but he did not wish in any way to limit the scope of Mr. Walker's remarks. Mr. Walker, observed Mr. Fulton, had made special reference to the difficulties of the gas industry at this time, and many of them had the feeling that gas was the Cinderella of the family so far as Government and local services were concerned. Much had been done to assist electricity by subsidies and in other directions, but nothing had been done to help the gas industry in the way in which it required most help. He referred, of course, to the removal of restrictions which in the light of modern conditions were no longer necessary. Central heating was one of the directions in which the gas industry would expand, and from which much of its future prosperity would come. There was a good deal to be said for gas for lighting. Personally he felt they had been at fault in the industry in not taking every opportunity to retain and develop the lighting load.

Mr. J. W. McLusky, Glasgow, proposed "The Provost, Magistrates, and Councillors of the Burgh of Helensburgh," and Provost Herbertson, in the course of his reply, said it had been an extraordinary pleasure to his colleagues and himself to act as hosts on this occasion. When the Town Council acquired the gas-works in Helensburgh thirty years ago, the undertaking was in a bad condition. The Council set about putting the place in order, and Helensburgh was, he thought, either the first, or almost the first, town of its size to adopt vertical retorts. He thought they would agree with him that such an innovation required a great deal of courage at the time it was undertaken. By careful and conservative management the gas undertaking had steadily progressed, and at the present time they were in the happy position of being able to supply gas at 5·68d. per therm, or 2s. 11d. per 1000 c.ft.

Gas v. Electric Lighting in Bradford.—A special sub-committee of Bradford Corporation which is inquiring into the relative advantages of gas or electric street lighting have asked the Gas Department to light one half of a new road called Canterbury Avenue, and the Electricity Department the other half. The merits of the two systems are to be compared on "scientific" principles. It is suggested that on the decision should rest the street lighting generally of Bradford for the future. The vast bulk of Bradford's street lighting at present is by gas.

Presidential Address of Mr. David Fulton, Helensburgh.

North British Association of Gas Managers, April 11.

The gas industry of to-day is in a very highly organized state. Changing times and conditions have brought about a realization of the advantages to be derived from corporate action as compared with disunited individual effort, and various national organizations have been created. That there are those who think that central organization has been overdone must be admitted. Such people fear the stifling of the individual, and the development of control by a bureaucracy. Any such tendency would be viewed with suspicion and must be avoided, as it can only result in disruption and rebellion. The dividing line between organization of policy and bureaucratic control may be defined as that at which coercion of the individual is introduced. I think the general good sense of the various members of committees may be expected to obviate any such danger, and that it is probably more fancied than real. What is a more real danger perhaps lies in the possible formation of a habit of thinking that corporate action by central organizations can accomplish all that is necessary. It is not so. The actions of the central bodies must be supported by undiminished individual effort, and there must be no relaxation of energy. The strength of the whole body depends on the strength of the individual, and each must pull his full weight in shaping the destiny of the industry.

The achievements of the National Gas Council have demonstrated the value of corporate action in all legislative matters affecting the interests of our industry, and if the measure of success attending their efforts in limiting the effects of legislation adverse to our interests, and in advancing legislation necessary to our expansion and welfare has not been all that we might reasonably have hoped for, it is easy to realize how very much actually has been gained. Thus we are made confident that there will be unremitting effort in striving for those objects which we think important to our well-being.

The British Commercial Gas Association continues to deserve our heartiest support, and proof of the effectiveness of its work is to be found in the steady increase of gas sales which its propaganda and national advertising schemes have assisted to create.

The prestige of the industry has been advanced by the granting of a Royal Charter to the Institution of Gas Engineers, and this recognition of the scientific nature of the gas engineer's duties must enhance the status and dignity of the office, and beget in ourselves an added keenness to be worthy of the honour.

Coal Mines Bill.

Coal is the largest single item of expenditure in the accounts of gas undertakings, and accordingly the Coal Mines Bill and the probable effect on the price of coal are matters of vital importance and grave concern to the gas industry. That it is feared largely increased prices must follow is evident from the strong criticisms passed by various Chambers of Commerce, Federations of Employers, and the leaders of our own industry, and even large numbers of coalmasters. How far those prognostications of evil are correct the march of events will show. Sir Josiah Stamp, at the meeting of the L.M.S. Railway, said the effect of the Bill would be to increase the Company's coal bill by one million pounds, while Lord Aberconway, Chairman of the Metropolitan Railways, said: "Too much importance need not be paid to rumours relative to an unreasonable increase in the price of coal. There is nothing to be feared from the legislative proposals before the country." When such important business magnates differ, how are lesser men to form an estimate of the probabilities?

Coal is the life-blood of our nation, and it concerns us all that the industry should provide a fair return to the owners and a reasonable standard of living to the miners. Government interference with the conduct of a competitive industry is to be deplored; but, since it appears that the Bill is assured of a safe passage, and obstruction can no longer serve any useful purpose, our thoughts should be turned to considering if the operation of its provisions can be given a direction which will not be to the disadvantage of coal consumers.

The lesson of the great strike of 1926 cannot be forgotten, and it may be better and cheaper to make some sacrifice for the sake of peace rather than face the dire results of a further clash of opposing forces. A direct advance in wages under present circumstances is impossible, and the Government have therefore sought to soothe the miner by making a concession of a reduction of one-half hour from the hours of labour. At the same time it is sought to bring about improvement in the industry by legislation providing for a co-ordinated selling policy. That such re-organization of methods of vending coal might have been achieved by the coalmasters themselves is agreed, but the fact remains that they have failed to do so, and this failure to bring about agreement within their own ranks has led to Government intervention.

Before the war the British coal trade was strong, prosperous, and a source of great wealth to the nation. The war, by disturbing the economic balance of Europe, and by upsetting all previous relationships, brought about a tremendous reversal of fortune, and since then millions of public money have been spent in subsidizing the industry, and further millions have been lost through strikes, so that a once powerful industry has been in constant travail. The Polish mines, before the war in strong German hands, have been engaged in a fierce conflict for supremacy in the European markets, and it is a point of view that most of the ills of the industry are due to the price-cutting campaigns of the British coalmasters in their efforts to re-establish the export trade, and that they are not caused by uneconomic prices in the home market. Without a co-ordinated policy it is not possible to effect an understanding, or definition of boundaries, which would lessen this cut-throat competition in the export market.

This rather long introduction leads up to the question—May not the provisions of the Coal Mines Bill contain possibilities which can help the coal industry back to the road of prosperity without prejudicing the position of the home consumer of coal? The direct answer is impossible, but the following ideas are put forward in speculative mood and in a spirit of mild optimism, and with a live sense of the fact that the ways of prophecy are beset with pit-falls. Such a point of view may not inoculate my audience with optimism, but pessimism has had a good innings in other places. Has there not been a tendency to exaggerate the effects on costs of the reduction in the miners' hours? Optimism or pessimism—whichever proves the correct attitude—depends almost wholly on the conception of their duties taken by the District Boards. Provided the Boards take wise, broad, intelligent views, the price of coal need not be raised to an extent which will bear oppressively on any industry, and any increase could be compensated for by improvement in the handling and preparation of coal; by the standardization of the sizes of washed fuels; by fixing maximum water contents; by greater attention to accurate weighing; by the careful classification of fuels on a basis designed to suit all the varying classes of consumers, so that ample supplies of suitable coal could be available for all; by making the quotas sufficiently elastic to respond quickly to demand, ensuring that no artificial shortage of suitable fuel could ensue; by eliminating wasteful competition; and by co-ordinating policy between districts to effect improvement of export prices.

These points possibly will not come to the front at the beginning of the District Boards' activities, but they appear almost an inevitable consequence of fixing prices equitably between coalmaster and coalmaster, and between coalmaster and consumer. No price-fixing arrangement can endure which does not take into account all the circumstances of the qualities of the coal, sizes of nuts, and assurance of deliveries.

There are patent defects in the Bill, notably that provision which allows of a quota being fixed for all collieries, apparently irespective of the cost of working; but if it should do something to instil the thought and create the spirit of co-operation it may lead towards that re-organization of the industry which everyone agrees is necessary. Without unification and co-ordination of marketing arrangements there seems no alternative to a continuation of letting things take their course, the owners in each district hoping that by some special dispensation they will benefit by the misfortune of the other districts.

Is not re-organization a better remedy than waiting tediously for the survival of the fittest? I leave the thought with you, and close these comments on this very controversial subject with a quotation from a broadcast talk by Sir Richard Redmayne: "Obsolete practices and methods must be rejected. The waste and duplication which result from numerous separate undertakings must be eliminated through amalgamation, and distribution must be simplified and cheapened. Above all, there must be peace in the coal trade."

Rationalization in the Gas Industry.

Rationalization is the new panacea for the ills of industry. Stripped of all verbiage, it means the extinction of individual enterprise, and the formation of giant trusts. Like everything else in life it contains something of both good and evil. Good in the possibilities of increased efficiency and reduced costs of production; evil in the power of monopolistic trusts. But rationalization of gas manufacture and supply can only be considered along the lines of the financial benefit to the consumers of gas.

In his Presidential Address a year ago, Mr. Napier, in masterly manner, stated the case for rationalization, or, as

he preferred to call it, co-ordination, and there seems general agreement that the principle has been established. But it is in the translation of the idea into practice that difficulties arise. Difficulties of defining areas; of which works shall operate, and which close down; of varying capital charges; of production and distribution costs; of reserves of manufacturing plant; of company and municipal ownership; of displaced labour; of the cost of pipe lines; of control; of policy; of local jealousies; of identity. All these, and doubtless others, are implied in schemes of co-ordination, and show how very necessary it is to see clearly the ultimate end of any plant before it is set in motion. In the creation of favourable opinion, and in an evolutionary progress of grouping, lies the surest hope of a permanent strengthening of the economic fabric of the industry.

The futility of financial fusions involving increases of capital for intangible assets requires no elaboration. That evolutionary movement is steadily gaining ground is demonstrated by the amalgamations and working agreements carried through in the last few years, and it appears certain that in future undertakings faced with expenditure for extensions or reconstructions will give more attention to the possibilities of co-operative agreements with their neighbours. The smaller gas undertakings in the rural districts threatened with powerful opposition of the electrical grid are a source of concern. Their position is the most vulnerable, but they may be expected at the earliest sign of danger to feel the urge to ally themselves to the nearest strong neighbour wherever such alliance is possible. We may grant that they know their own business, and realize the advantages of consolidating the position before ground is lost which can never be recovered.

Pervading and dominating the whole question is the future relationship of the gas and coking industry. The rapid growth of the latter is making available ever increasing quantities of coke oven gas for which an outlet is sought, and the natural outlet impinges on the territory of established gas undertakings. In this there are elements of antagonisms, and much delicate negotiation will be necessary before the respective positions are defined. But that wise counsels will prevail and satisfactory agreements be arranged may be assumed. Parliamentary intervention and compulsory net-work schemes of gas supply are anathema to an industry which has always shown an open mind towards methods of improving service to the public. In the result we may find areas supplied with coke oven gas, with existing gas undertakings acting as distributors, safeguarded as to continuity of supply, and the price must be such as to permit of large developments in the use of gas for industrial purposes. The gas industry has rights to preserve and should be consulted before additional coke oven plants are put down. These cannot operate with commercial success unless the gas can be taken up, and there is present a danger that production of coke is outstripping actual and potential demand.

Education Scheme.

As Hon. Secretary of the Scottish District Advisory Committee, I have been associated with the operations of the Education Scheme since its inception in 1923, and I hope, therefore, I may be pardoned for making some observations on a subject which may already seem to have been discussed *ad infinitum*.

The work has had disappointments and encouragements, but over all it is gratifying to feel that the number of young men taking up the specified course of training is steadily increasing. In earlier days I frankly admit that I was afraid the Scheme would be supported only by those situated near our few large cities, and that the country districts would simply ignore the Scheme because of difficulties in fulfilling the requirements in respect of attendance at technical classes of the proper standard. There is no sight more pathetic than that of frustrated ambition, and some of the cases which came before the Committee excited our keenest sympathy. In others there could not be avoided a suggestion that there was a lack of backbone, and a tendency to mourn over the apparent handicaps rather than be up and doing to make the best of the available resources.

The modifications of the Scheme adopted at the Annual General Meeting of the Institution of Gas Engineers last June have, as far as seems humanly possible, removed the disabilities of the existing and potential students in the isolated areas, and it is now incumbent on them to seize the opportunity afforded and apply themselves with energy to study all the ancillary subjects by whatever means seem most convenient to them. There is no stigma attached to being an external student. The justification of the new Scheme depends entirely on the number of additional candidates brought into its orbit, and I wish to appeal strongly to the whole of our members to encourage suitable young men to enrol in the ranks of candidates, so that Scotland's tradition of passion for education and knowledge may be preserved and enhanced. Equality of opportunity is an ideal, and everybody pays tribute to it in theory, but in actual practice it is impossible of accomplishment. Students less favourably situated geographically must suffer disadvantages in the matter of facilities for technical instruction as compared with students in, or near, the larger cities. There are now three Colleges in Scotland carrying on approved courses of study—the Royal Technical College, Glasgow; the Heriot-Watt College, Edinburgh; and the Dundee Technical College. All the courses are excellent, but none ideal, for it is a matter of the greatest difficulty to include in a five-year evening class course that amount of instruction in the basic subjects—Physics, Chemistry, and Engineering Science—which form the foundation for sound knowledge of the principles governing the practice of gas engineering and gas supply.

It is a purely personal opinion that it would have been better had the Institution made the course for the Higher Grade Certificates at least one year longer. But it was probably felt that students would object to a longer period, and some sacrifice had to be made to secure their goodwill. Nevertheless the extra year would have been in the students' own interests. The first three years of the course leading up to the Ordinary Grade Certificate are in order. But the further period of two years leading up to the Higher Grade Certificates is overburdened. Accordingly, there is the danger that the student, thinking of the examination in the principal subject, is inclined to do no more in the ancillary subjects than is sufficient to enable him to secure the number of marks required to qualify in the respective subjects. In Huxley's words: "They work to pass, not to know; and outraged Science takes her revenge. They do pass and they don't know." A sixth year in the course would have avoided this danger, and broadened the basis of the studies preliminary to intensive study of the principal subject. Further, the candidate's practical experience would have been greater, and he would have been better equipped for the examinations.

The results in the Higher Grade Examinations seem to support the view that a considerable number of the candidates who present themselves have been in rather too much haste. The proportion of second-class certificates to first-class certificates bears this out. It ought always to be borne in mind that examinations are not the be-all and end-all of the Scheme. The certificate is a hall-mark. The true object of the Scheme is a sound educational training. This should never be allowed to become secondary to mere success at the examinations. Further, academic qualifications must be complementary, and not superior, to practical training, and the preservation of a proper balance between these requisites of the fully-equipped man must be kept clearly in view.

The generosity of gas undertakings in Scotland has raised a fund which is now assuming useful proportions. Annual grants have been made to the technical colleges to encourage the maintenance and continuation of classes in the principal subject, and the Council is also prepared to consider grants towards payment of correspondence fees to suitable students in certain circumstances. The Council intends also to give consideration to suggestions of a scheme by which the interest and keenness of students may be enlarged. The industry must encourage and show its faith in the Scheme by a readiness to promote and raise to positions of responsibility those who have shown ambition in preparing themselves for responsibility.

Carbonizing Plant.

The gas engineer contemplating the installation of new carbonizing plant has at his disposal a range of choice almost bewildering in its variety. For several years Scotland's medium and larger works have shown a marked preference for the vertical retort. This may be accounted for by the fact that the majority of the Scottish coals have a low caking factor, and are very suitable for vertical retorting. This development has been accompanied by a radical change in the calorific value of the gas supplied, and Scotland, once famous for high-quality gas, may now be said to lead the way in the use of low calorific value gas. The tendency in favour of still lower calorific values has apparently been checked, but there are here and there occasional enterprising engineers who are experimenting with qualities even below 400 B.Th.U. This inclination is probably more evident in the smaller works where plants of the total gasification type have gained a large amount of ground. These plants seem to give satisfaction, and no difficulty is apparently found in giving satisfactory service to the consumers with gas of less than 400 B.Th.U. per cubic foot.

The general effect on the coke market has been good, as quantities available for outside sale have been reduced, and production limited to more manageable proportions. A few years ago it was thought that vertical retorts in the smaller works would not be economical; but the skill and enterprise of the contractors has enabled them to construct plants which meet the requirements of the smaller works, and there are now vertical plants operating in at least two works of only about 25 million c.ft. per annum. From all accounts they are thoroughly justifying their adoption.

The horizontal retort has been enormously improved, and is now capable of doing work which a decade ago would have been thought impossible. It still retains many supporters among those whose nearest coals are of a caking nature, and who attach importance to a large coke production. Whatever form of plant is adopted for a works must depend on factors such as ground space, the nature of the cheapest coal, the

market for coke, capital costs, working costs, and maintenance charges. The general drift is undoubtedly in favour of larger thermal yields of gas per ton of coal, with less dependence on the value of bye-products—a movement which seems justified by the trend of world prices of residual products.

Coke.

Coke has maintained a satisfactory price during the past year, but, as always, there has been the usual seasonal price-cutting during the winter. This annual period of disorderly marketing is to be deplored, as it seems preventable by a little arrangement. There are signs that gas coke is being threatened by more opposition from blast-furnace coke and from low-temperature coke, and a greater measure of co-ordination between sellers must be achieved if a reasonable price is to be maintained. There is no desire to force an undue value, and even if there were such a desire, competition of other fuels would speedily defeat this effort. The most that can be attempted is the maintenance of a stable price bearing some relation to the cost of coal. Each winter production exceeds demand, and stocks accumulate; but they accumulate very unequally, as some works have little or no stock, while others carry heavy stocks, much depending on the coke consuming capacity of the respective areas. It is surely not an impossible matter to arrange something in the nature of quotas for stocking, and prevent haphazard, lop-sided stock carrying. The present lack of method results in coke being dumped on the market when holders can hold no longer, and the price is lowered for everyone. It is not good business. Coke pools have their advocates, but they should not be necessary, if sellers in each district will only keep closely in touch with each other and show a greater readiness to individual sacrifice when the general interest demands sacrifice. The improved demand for coke for export and the readiness of seaboard towns to export coke have helped home prices enormously. The use of coke for domestic purposes is receiving more and more attention, and will bring reward if the coke is properly handled. In Scotland the majority of the gas cokes are small in size and breaking is hardly necessary. All that is required is evenness of size, a low moisture content, and freedom from dirt.

The Gas Undertakings Act.

The Gas Undertakings Act, passed by the Conservative Government last year, proved once again the wisdom of not putting trust in Governments, as it fell far short of giving the gas industry that freedom which it has every right to expect. One apparent effect has been the wholesale issue of compulsory orders to statutory gas undertakings which had not voluntarily adopted the therm method of charge specified by the Gas Regulation Act, 1920. The advantages of that system to the consumer of gas who is supplied by a municipal non-profit earning undertaking are probably more illusory than real, but there are advantages in the standardization of gas-works statistics enabling comparisons of costs to be made on a similar basis. The necessity of working closely to a standard calorific value compels disciplinary attention to carbonizing details, and promotes a high standard of efficiency. It seems a little illogical, however, that it should be possible for a number of municipal undertakings operating under the therm system to carry on without the appointment of an independent gas examiner. Surely some simpler method could have been evolved than leaving the matter to a number of consumers, however small, to make an application to the Sheriff. If the Act is not to be stultified it should be carried out in its completeness, and the maintenance of the declared value properly certified. There is a further illogicality that the non-statutory undertakings, of which there are a large number in Scotland, remain outside the Act. In theory they run the risk of interference from Highways Authorities in respect of laying and repairing gas mains, but in actual practice their right to do so is never questioned. We have, therefore, the quaint position that the non-statutory undertaking escapes all those restrictive measures imposed on the Government recognized and protected undertakings. They are free to charge for gas by whatever method they choose, and to conduct their business in the way which seems best suited to their objects. We may wish that they be long spared to enjoy this freedom.

Electricity versus Gas.

Competition with electricity grows in intensity, and considering that so much of the contest is in the same field, it is exceedingly satisfactory that gas continues not only to hold its own but to show increased sales. But that must not cause the slightest degree of complacency. The struggle is much too stern, and effort to maintain and strengthen our position must be unresting.

Until the year 1925 the Helensburgh Gas Undertaking enjoyed freedom from the competition of electricity. In that year a public supply of electricity was brought into the Burgh, and I was caused many a quiet smile by the frequent questions of kindly interested citizens: "What will you do when the electricity comes in?" I think some of them really expected the early appearance of a "To sell or let" notice on a closed gas-works gate. Maybe the smile was of a rather sober type! It is a little saddening to realize that after the many years of service rendered by gas to the public there should be people who think that gas is a decadent industry. The moral of the story is that we have not been successful in creating that favourable atmosphere which believes in gas as a matter of course, and just because it is the right thing to do. How such an atmosphere is to be developed is a problem not capable of simple solution, but I do think strongly that the uses of advertisement must be employed to a greater extent. Advertisement must be both national and local, and directors and councillors must take broader views of expenditure on these heads. People in the gas industry must take advantage of every opportunity of talking gas in public. Too many gasmen are afraid of talking gas, almost as if they were ashamed of their business, or through fear of being thought bores. In a world of speed and bustle one must shout loudly if one is to be heard. The case is a good case, and the motive a good motive. I concede that I may be wrong; the reasons are perhaps sound, but my own opinion is that there is too much passiveness in the policy of our leaders in regard to publication of facts and figures relative to comparative costs of gas and electricity. I should like to see a stronger, more fighting policy. Dignified silence is apt to be misunderstood, and half measures are only softness and are assessed at their true value.

The gas industry requires to be freed from shackling restrictions. In the days when gas enjoyed almost complete monopoly, restrictions may have been necessary. But these times are long past, and force of competition could be depended on to prevent any possible abuse of freedom. Freed from hampering legislation, the industry could develop along the lines which seem best suited to its interests, and accordingly in the interests of the public it serves. Compared with the favour shown to electricity, the treatment accorded to gas by successive Governments is, to say the least of it, unjust. The belief of the politicians that a cheap and abundant supply of electricity can be obtained by grandiose schemes, subsidized by public money; that by carrying electricity into every village, hamlet, and farm-house in the country, the industries and agriculture of this country can be revivified, and new industries created in the hills and glens, and prosperity everywhere, is but a mirage—or, in the words of Samuel Butler—

> "An *ignis fatuus* that bewitches
> And drives men into pools and ditches."

The pools and ditches await unreasoning optimism. The scheme is merely spectacular and will not cheapen electricity. Economic factors will inevitably exert their influence, and prove that there are many pitfalls for those who would progress too rapidly. Electricity is a great force, with as yet unrealized possibilities, and should have been allowed to develop on evolutionary lines. Government interference and extravagance in money and in promise have forced electricity and gas into false positions. Instead of being in a state of intense rivalry they should be co-operative in service to industry and social life. Each has functions which it is particularly suited to fill, and a broad statesmanlike grasp of first principles would have recognized this, and avoided much economic waste.

Sales Development.

The intrusions of electricity in the field of lighting must give us cause for serious thought. The attitude of the public is quite definitely expressed in the remarks of the layman who, struck by examples of good gas lighting, pays it the left-handed compliment: "I thought it was electric light." It is not a matter of the merits of the rival illuminants, it is an intangible faith unconsciously acquired, and therefore, being a matter of instinct rather than reason, is not very susceptible to argument. That electric light is still something of a luxury, something thought fashionable and up-to-date, is probably the truest explanation of this attitude.

A great deal has been said and written on the subject of preserving a fair share of the lighting load for gas, and it seems fashionable to charge the industry generally with slackness of effort. The charge may be true, or it may be exaggerated, but whether or not, recrimination goes but a short way to improving the position. A plan of action is more to the purpose. The lines of such action seem fairly clear. Systematic maintenance backed by adequate pressure of gas of regular composition. Encouragement of the use of the best type of burners by displays of burners in use giving consumption, efficiency, and cost. Education of the public to the advantages of gas as to sterilizing, ventilating, and heating properties, and perhaps most important of all, the quality of the light in mellowness and kindliness to the eye.

The last point is, I think, already at least subconsciously realized, and we shall do well constantly to endeavour to bring it into the foreground of the public's thoughts.

Any measure of success achieved will have a twofold effect, for once electricity obtains a foothold for lighting a breach is made in our defence of the cooking and heating load. Full use can then be made of the differential rating system in which a high customer charge is allied to a low commodity rate, or, alternatively, a low power rate is subsidized by a high light-

ing rate. In our own district the two-part electricity tariff gives a consumption rate of one halfpenny per unit for all purposes, and it is only our very low price of gas that is the saviour of a great deal of business. The gas industry is handicapped by the flat rate system of charging, which, despite graduated discounts, is much too inflexible for modern circumstances. That electricity enjoys the benefits of a more flexible method of charge is surely a sound reason for the gas industry obtaining equal rights. The amount of the customer or service charge required by the gas industry would be comparatively innocuous even to the poorest of our consumers, and the liberty to frame rates on a scientific basis would permit of our developing sales for industrial purposes and for water heating and central heating. I strongly believe that at a reasonable price there is a great volume of business awaiting us in the application of gas for central heating. My Department has on several occasions been offered very useful loads for the heating of large greenhouses and large residences. But none of this business has matured owing to the unfavourable comparisons of running costs. A year or so ago a consumer offered to use gas for central heating in his house, and was willing to pay 50 p.ct. more for gas than for solid fuel. On the superficial view this was an offer which gave us a chance, but after going very carefully into all the figures of B.Th.U. consumption and relative efficiencies it had to be admitted that we could not meet the requirement regarding cost. At 5½d. per therm the estimated cost was practically exactly double that for the solid fuel. A greater measure of flexibility in price is therefore necessary to enable us to enter into this class of business. The above proposition was somewhat affected by the fact that it was made a further condition that the existing sectional boiler should be converted to gas-firing. In investigating the possibility of such conversion it was found that in this country very little attention has been paid to the matter, but it was discovered that in America the practice of converting solid fuel boilers to gas is quite common, and an American firm with whom we corresponded gave a considerable amount of very interesting information, and incidentally claimed very high efficiencies for their conversion sets. This is a matter which seems worth the attention of our appliance manufacturers, as consumers possessing boilers in good condition are less likely to consider a gas proposal if it is necessary to purchase a new gas boiler, which is more costly than the ordinary solid fuel boiler.

Noteworthy advance has been made in recent years in the efficiency and appearance of gas cookers. The all-enamel cooker has appealed to public taste, and in regard to saving of labour possesses obvious advantages. But to undertakings which issue cookers on simple hire, or long-term hire-purchase, this is not an unmixed blessing, as older cookers returned from the district in sound condition with a period of useful life still in them are made more difficult to re-issue, and undertakings are faced with the loss due to obsolescence. But my opinion is that it is much better to bear this loss rather than deny to the public freedom of preference. Limitation of choice is apt to react in favour of the electric cooker. On the subject of cookers one is inclined to wonder if the point of view of the housewife is always given sufficient consideration by the manufacturers and their research staffs in their search for higher efficiencies. Hotplate bars of uneven surface are very frequently criticized, and remarks are pointed and illuminating. Criticism is also directed to getting rid of cooking smells, and of the waste gases from the hotplate. The housewife is interested in economical working, but she is equally concerned with cleanliness, and a predilection to view with favour cookers of the closed top type is not without significance, for in cookers of that type the products of both oven and the hotplate waste gas are carried away in the flue pipe. A smooth top is very attractive to the user and is a selling point of some importance. More consideration requires to be given to the use of canopies with open-top cookers, though it has to be admitted that they are rather ugly, and that there are often difficulties in finding space for them. In the housing schemes recesses for the cooker should not have been permitted to be ignored by the architects without strong effort being made to impress them with the obvious advantages of such provision.

The salesman and salesmanship are receiving greater attention, and the uses of direct canvassing seem to merit more consideration than has hitherto been given. The good salesman must know the articles he is selling and have personality and tact.

[Part II. of Mr. Fulton's Address deals with the Helensburgh Undertaking, and this will be published in the "Journal" next week.]

London Juniors Spend an Interesting Day in Birmingham.

The second of the London and Southern District Junior Gas Association's visits to be spent outside the home counties took the form of a trip to Birmingham on Wednesday, April 2 last, in order to inspect the works of the Bromford Tube Company, Ltd., and also those of Tubes, Ltd., Rocky Lane, Aston, an affiliated Company.

Leaving Euston at 9.10 a.m., Birmingham was reached in two hours, and the Association proceeded directly to the Queen's Hotel, where they were welcomed on behalf of the Bromford Tube Company by Mr. M. A. Wolff, Managing Director, Mr. S. M. Tate, a Director, and Mr. J. Parkinson, the Works Manager. Among those present were the President of the London Juniors (Mr. F. S. Larkin) and other senior members of the Association, including Capt. W. J. Liberty, Hon. Secretary of the Institution of Public Lighting Engineers; also the London Representative of the Tube Company (Mr. J. N. Thompson), the Southern Representative (Mr. H. C. Ife), Mr. C. D. Macartney-Filgate, one of the guides on the subsequent tour, and Dr. Jenkin, Director of Research; while also present were the President of the Midland Junior Gas Association (Mr. A. R. Myhill) and the Secretary (Mr. H. C. Wills).

The visitors were entertained at luncheon prior to the tour of inspection, and, the Loyal Toast having been honoured, Mr. Wolff addressed a few words of welcome to the Association.

Quality First.

Mr. Wolff said that he would like, on behalf of the Bromford Tube Company, to welcome the London and Southern District Junior Gas Association to Birmingham that day. They had come down to see their works, and they were going to show them everything possible. They were a commercial firm, said Mr. Wolff, whose job, naturally, was to make profits, if they could; but they always bore in mind, and those responsible for the carrying on of those businesses were always endeavouring to instill into their employees and staffs, the fact that quality must come first. They would realize, continued Mr. Wolff, some of the firm's difficulties, while they on their side, he hoped, would gather from the visitors some of their difficulties, and thus between them he hoped they would be able to surmount those difficulties. They heard a lot in these days about the depression in this country, that the country was on the downward grade. But he did not believe a word of it, and to show that his Company also did not believe a word of it, they would see during their inspection the foundations of a mill which would when completed make the biggest seamless tubes in the country. They also heard a great deal about the British manufacturer making what he thought was right and saying "take it or leave it." That also he denied; British manufacturers were not doing that in these days—at any rate, the Bromford Tube Company were not.

The President (Mr. F. S. Larkin) said that they thanked the Bromford Tube Company most sincerely for this visit. Most of the members there that day had never had the opportunity of seeing the actual process of tube manufacture, and they looked upon it as educational business. They were therefore very grateful to the Bromford Tube Company for extending such an opportunity as this. He most heartily associated himself with all Mr. Wolff had said; it was of benefit to themselves to see what was being done in Britsh production. They heard a lot about foreign competition; but while they had in England manufacturers such as these they need have no fear. He thought he could not do better than ask Mr. Myhill, the President of the Midland Junior Gas Association, to say a few words. "Will you convey to your Directors," concluded Mr. Larkin, "our hearty appreciation of your entertainment here to-day."

Mr. A. R. Myhill said that, as President of the Midland Juniors, he just wanted to take this opportunity of thanking the Bromford Tube Company for inviting them of the Midland Association to meet their colleagues of the London and Southern District Association. The Bromford Tube Company had always been very kind to the Midland Association, and to the Junior Associations' movement in general. Without the co-operation of public-spirited firms in this way it would be a much more difficult matter for the Junior Gas Associations to carry on their work. The Junior Associations (there were, he believed, eight of them in Great Britain under one central Joint Council) had as their work the education of the younger members of the gas industry. The gas industry was by no means dead, said Mr. Myhill; but they were rather apt to hide their light under a bushel as an industry. He felt sure that firms such as the Bromford Tube Company, by encouraging the younger members of the gas industry—who were the gas managers of the future—were encouraging a great national industry and adding to the stability of the nation.

Description of the Tube Works.

Upon entering the Main Works Gate, the visitors were at first confronted by the new Research Laboratory, and behind this the steel stock yard where the raw materials for the manufacture of seamless steel tubes are carried. On the left were to be seen the seven main bays which house the main tube rolling plant. This plant produces hot finished seamless tubes, by the rotary piercing and "Pilger" rolling processes, and covers a range of sizes from ¾ in. nominal bore up to 12 in.

No. 1 Bay is at present undergoing re-arrangement, but when the machinery in this building is put into production it will augment the output of the present mills at the lower end of the range of sizes.

No. 2 Bay houses the portion of the plant dealing with small tubes up to about 2½ in. O.D. Before entering this bay, the visitors saw in the open yard on the right steel billets being cut from stock lengths to suitable working lengths by sawing and breaking. Upon entering No. 2 Bay, the visitors saw first a re-heating furnace, where the cut billet is re-heated up to a temperature in the region of 1300° C., prior to being passed through the rotary disc piercing mill; this being the first process through which the billet passes and upon leaving this mill is in the form of a rough tube or bloom. While still hot, the bloom is conveyed to one of the two "Pilger" mills, where it is threaded on to a mandrill and rolled down to the required size and length. The tube is then practically a finished article with the exception that the ends have to be cut off square.

In this same bay there is a further re-heating furnace and reducing mill. This machine reduces tubes as produced on the "Pilger" rolling mill to one of several smaller sizes in one pass, the ultimate size being determined by the number of pairs of rolls employed. The object of this reducing mill is not to put a further operation upon the tubes, but to facilitate the rapid production of various sizes of tubes in very long lengths and to obviate the use of a variety of different sized rolls in the "Pilger" mill. This reducing mill is very quick in action, and the tubes, after leaving the mill, are passed through a straightening machine, and on to a motor-driven cooling bed, which keeps the tubes revolving, until reasonably cold, to ensure straightness.

In No. 3 Bay the visitors observed the process as above described, but the tubes produced are rather larger—*i.e.*, up to 3¼ in. O.D. No 4 Bay is a similar but still larger plant for producing tubes up to 4½ in. O.D. With the "Pilger" mills in this bay, a straightening machine only is employed.

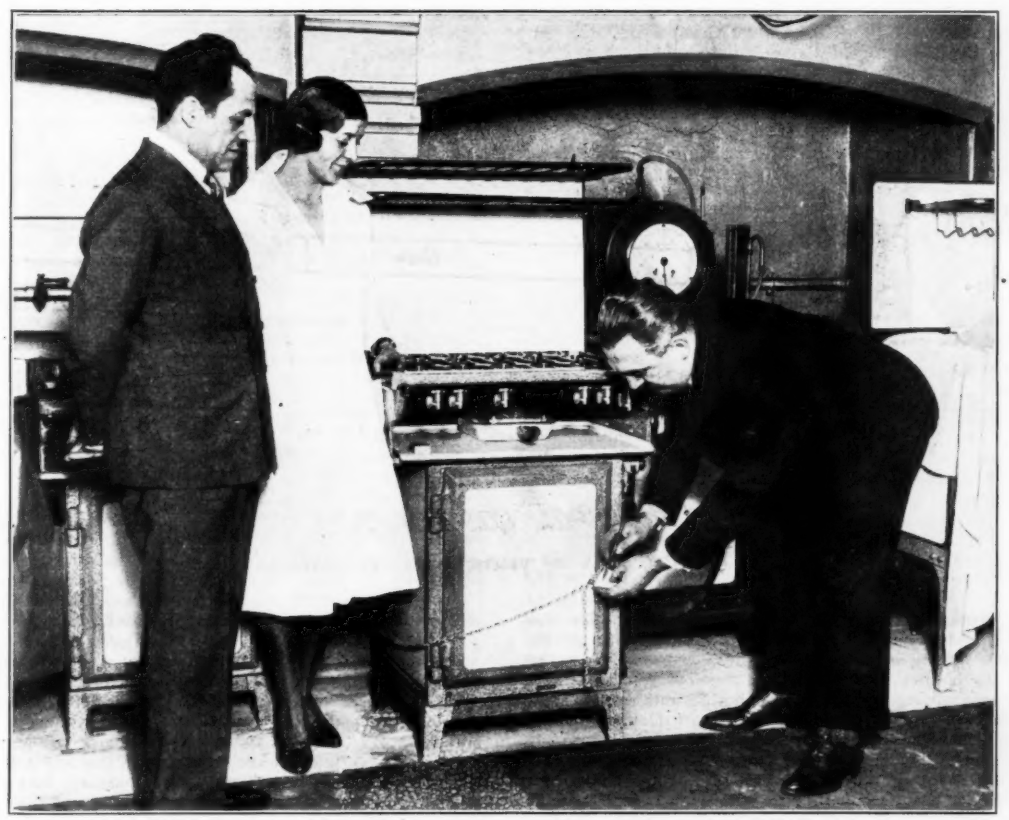
A still larger plant is housed in No. 5 Bay, which produces tubes from 4½ in. O.D. up to 12 in. O.D. The process here is again similar to that already described, with the exception that the piercer, instead of being of the rotary disc type, is of the "barrel" type, and consists of three barrel-shaped rolls which are disposed at an acute angle to the axis of the billet. The blooms are taken from this piercer either to the 6-in. mill or the 9-in. mill, according to the size being rolled at the time.

No. 7 Bay, at present under construction, is intended to house a still larger plant to augment the capacity of the works.

In addition to the actual manufacture, the visitors were shown the following productions, both during and after manufacture: Tubular steel poles for overhead power transmission; lighting standards; spigot and faucet pipes (coated and wrapped) for underground gas and water distribution; tubes with patent "Carlton" joint for various purposes, particularly those in which a cheap, quickly assembled joint is required with flexibility; flanged piping and fittings for gas, water, and steam distribution; boiler circulation tubes; superheaters, &c.

At the works of Tubes, Ltd., various stages in the production of cold drawn tubes were inspected, together with tubes for axles for the motor industry, &c.

Automatic Cooking Demonstration at Radiation House.



M. FRANCOIS LATRY, CHEF DE CUISINE, SAVOY HOTEL, SEALING THE LOCK ON THE "NEW-WORLD" OVEN AT THE COMMENCEMENT OF THE COOKING TEST.

"Marvellous!" was the expression used by M. F. Latry, Chef de Cuisine of the Savoy Hotel, last Wednesday, on seeing the results of cooking a six-course dinner simultaneously in a "New World" "Regulo"-controlled oven at Radiation House, Grosvenor Place, S.W. 1. "And the cooking itself?" we asked him. "Excellent," he replied.

It is really astonishing to think that a six-course dinner (consisting in this instance of tomato soup, halibut, braised sweetbreads, chickens, bread sauce, seakale, baked potatoes, sweet-pudding, and cheese straws) can be cooked at one time, without any attention on the part of the cook, in an oven with a gas consumption of 33 c.ft.

In Wednesday's test, the chickens and potatoes, which require the greatest heat, were placed on the top shelf fitted in the third runner from the top of the oven; the seakale, fish, and soup on the second shelf in the fifth runner; the sweetbreads and pudding on the third shelf in the seventh runner; and the bread sauce and cheese straws on the baseplate. The "Regulo" was set at Mark 7, and the cooking time was 1¼ hours.

Several chefs of famous hotels were present, and they were unanimous in their approval of the cooking results and of the virtues of gas, which makes the preparation of such a complicated meal so simple a procedure.

New Installation of Glover-West Retorts at the Municipal Gas and Electricity Works of Brno, Czechoslovakia.

By Ing. Dr. techn. Frant Perna.

The building at the Brno Gas-Works of an installation of Glover-West vertical retorts for the manufacture of town gas and also the erection of the ancillary plants for the transport of coal and coke were completed in the month of October last year. The new installation at Brno represents the third time the Glover-West system has been chosen in Czechoslovakia. The first retorts on this system were built by Messrs. West's Gas Improvement Company at Plzen in 1925, the second installation was erected on the Prague Gas-Works by the French "Compagnie pour la Fabrication de Compteurs et Materiels d'Usines á Gaz," while the building of the Brno installation was carried out by the same English Company that had designed and executed the work at Plzen. The decision of the Brno Gas Department to reconstruct the carbonizing plant was not dictated by an insufficiency of reserve plant to meet the increasing consumption, but rather by the fact that the existing installation was so antiquated and worn out that a complete renovation from top to bottom would have been necessary in any case.

At the time of commencing the reconstruction of the retort house, the production of gas at the Brno Gas-Works was carried out in eighteen settings of horizontal retorts on the Gareis system having a total capacity of approximately 30,000 cub.m. per 24 hours; two settings of vertical retorts on the Baecker system giving 10,000 cub.m. daily; and two Strache producers for the supply of 10,000 cub.m. of Doppel-gas per day. Of the two producers, the larger one was operated in winter, and the smaller one worked during the summer months. Since the actual maximum production of gas did not exceed 30,000 cub.m. per day at that time, it will be seen that the gas-works was comparatively rich in carbonizing plant. The reserve, however, was more apparent than real.

Of the above-mentioned installations the Baecker settings were twenty years old, and apart from their age suffered from many defects of construction. For this reason the production of gas in these settings was so uneconomical that they had not been used for many years, although they were repaired and prepared for use just after the war. The considerable distance of the producers from the retorts, the defective arrangement of the combustion chambers, and the very short recuperators were together responsible for a very high fuel consumption (25 to 26 kg. of coke per 100 kg. of coal carbonized) and for correspondingly high chimney losses. The dimensions of the ascension pipes, hydraulics, and foul-gas mains were so abnormally small that considerable pressure developed in the retorts and large amounts of coal gas escaped through the cracks and fissures of the retorts into the combustion chambers and chimney flues. Per 100 kg. of coal carbonized in these retorts, only 26 cub.m. of gas were obtained (say, 9330 c.ft. per ton).

The Strache generators for the production of Doppel-gas, erected in Brno in the years 1917-18, actually formed the first test installation of this sort in Europe. The generators had several disadvantages. Due to the low thermal efficiency, to the insufficient recovery of sensible and chemical heat-energy from the blow-gases, and to the expensive methods of operation by hand, due also to the fact that a steam boiler had to be kept in operation specially for the producers, the cost of manufacturing Doppel-gas, calculated per 1000 kg.-calories, was found to be greater than the cost of producing coal gas in the existing horizontal retorts.

Among the various types of carbonizing plant available on the gas-works at this time, the horizontal retorts of the Gareis settings gave, comparatively speaking, the best results. In these retorts an average of 30 cub.m. of coal gas with a gross calorific value of 5800 to 5900 kg.-calories per cub.m. (0° C., 760 mm. hg.) was produced per 100 kg. of coal, with a fuel consumption of 18 kg. of coke per 100 kg. of coal, neglecting the coke carried away in the ashes and recovered later, say, 10,760 c.ft. per ton at 617 to 627 B.Th.U. per c.ft. (60° Fahr., 30 in. hg.) gross fuel consumption 18 p.ct.

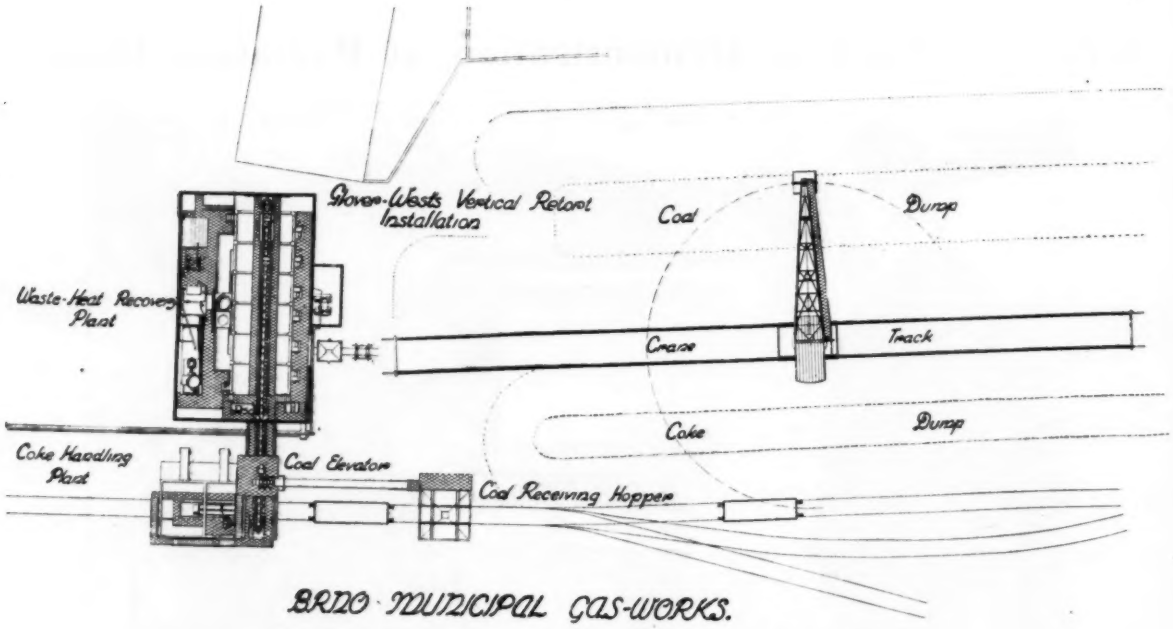


FIG. 1.—GENERAL PLAN OF VERTICAL RETORT INSTALLATION.

In these settings, however, the costs of production were seriously increased by the hand-charging of the retorts. The 8-hour shift introduced after the war had the effect of increasing the number of workmen by one-third. In addition, the hourly output per stoker, in comparison with that of pre-war days, was reduced by one-third in accordance with the terms of a collective agreement. Since, apart from the foregoing, half of these settings were in a very dilapidated condition, and the Gas Department would have been compelled entirely to renovate the majority of them from top to bottom, it was decided that a complete new retort house based on the most modern technical progress should be built. This would necessitate a higher capital-expenditure, of course, but would also render possible a far more rational operation and would give a corresponding reduction in the costs of production.

Using the daily production at that time as a basis, and assuming that the production of town gas in Brno would increase in the future, it was definitely decided that the new unit-capacity, compared with the old, should be considerably increased, and that only chambers or large retorts be considered. Horizontal chambers were ruled out, because they demand a considerable ground area, and the Brno Gas-Works, which lies practically in the centre of the town, has no surplus of available building-sites. Concerning the remaining systems, each competing firm was allowed to put forward the system considered

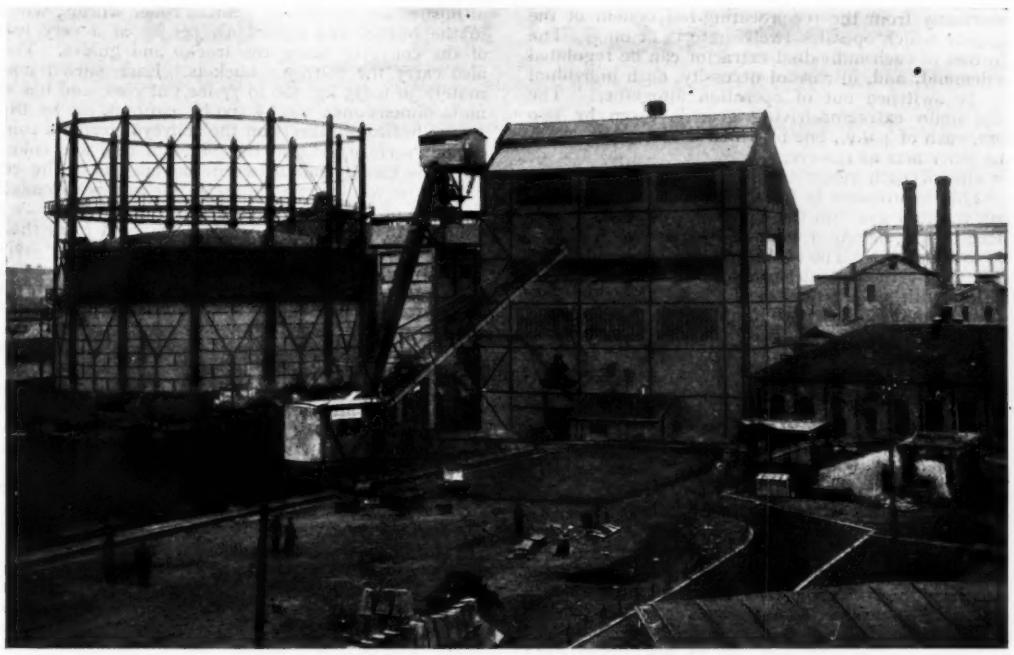


FIG. 2.—GENERAL VIEW OF GLOVER-WEST VERTICAL RETORT HOUSE.

best suited to the prevailing conditions at Brno. As a result the Stettiner Chamotte-Fabrik A.-G. vorm. Didier, co-operating with the society "Bamag," put forward inclined chamber ovens; the Limited Company, formerly the Skoda Works, in conjunction with the Compagnie pour la Fabrication de Compteurs, offered a French system of vertical chambers, and West's Gas Improvement Company, Ltd., tendered for Glover-West continuously operated vertical retorts. Of the systems submitted, preference was given to the Glover-West continuously operated vertical retorts. These retorts were chosen because of the excellent heat-efficiency of the system, because of the greatest make of gas per ton at the same calorific value, because of the minimum amount of hand operation, on account of the excellent arrangement of the various auxiliary plants and the admirable choice and exploitation of the building-site, and last, but not least, for hygienic reasons.

The project for the erection of Glover-West continuous vertical retorts was submitted to the Brno Gas and Electricity Department at the beginning of the year 1927, was accepted, and was placed before the Town Council in April of the same year. After several meetings and discussions the Town Council granted approval, and the order was passed in February, 1928. The foundations were commenced in August of the same year, the complete plant was finished at the end of September, 1929, and the settings were put into operation on Oct. 19, 1929.

The order for the building of the Glover-West retorts was placed with the English Company only on the definite understanding that the whole of the refractory materials be purchased in Czechoslovakia, that the delivery and erection of the steel and ironworks and machinery be carried out by the Ironworks in Brno, and that not more than 1 p.ct. of the whole deliveries be brought from abroad. These conditions were completely fulfilled. The refractory goods were delivered by the West Bohemian Kaolin and Chamotte Company from their works in Horní Briza, and the same firm carried out the erection of the setting-brickwork to the drawings and under the supervision of the English Company. The structural steelwork and all the machinery were divided between the Brno Kralovo Pole'er Waggon and Machine Works Company and the First Brno Machine Works Company. The insulating material was delivered by the Calofrig Company, and the building works were carried out by the Contractor, Stanislav Nedela.

The new retort house with the auxiliary machinery was not built on the site of the old carbonizing plant, but was erected at the other end of the gas-works in the immediate neighbourhood of the existing railway sidings and coal store. The new position obviated the necessity for handling the coal wagons by the transporter bridge and for twofold handling of the coal.

The construction of the foundations of the retort house presented certain problems, because the load-bearing capacity of the sub-soil was poor, and the municipal building office had fixed the maximum permissible loading at 1 kg. per sq. cm. (18·4 cwt. per sq. ft.). All conditions were met, however, by constructing the foundations in the form of a reinforced-concrete raft, 26·6 m. long, 17·5 m. wide, and 1·85 m. deep. (87·3 ft. by 57·4 ft. by 6·07 ft. deep.)

The concrete consisted in the average of a 1 : 5 mixture. During the excavations for the coal-breaker pit ground-water was encountered, and the deeper portions of the pit had to be constructed with the aid of an insulated iron caisson. The construction of the foundations, the building of the settings, and the erection of the machinery proceeded throughout without a hitch and without giving the slightest ground for complaint.

The new plant for the production of town gas comprises a retort house, a coal-breaker pit, a coke-screening plant, a crane, an elevator, and a conveyor. The retort-house building, which is only 21·5 m. (70·5 ft.) long, 12·5 m. (41 ft.) broad, and 24 m. (78·7 ft.) high, houses six producers, twenty-four retorts with the necessary collecting mains and foul-gas main, six coal bunkers, two coke storage hoppers—one for feeding the producers and one for filling the retorts after scurfing—a conveyor and a steam-boiler, complete with superheater, which is heated by the waste gases.

For the transport of coal from the coal store and from railway wagons to the retort-house plant, and for the carrying of coke from the retort house to the coke store (and the reverse), a crane has been provided to run on a ground-track 70 m. (230 ft.) long, with a gauge of 3 m. (9·84 ft.). The crane has a jib-radius of 16 m. (52·5 ft.) and the ropes are prepared for the reception of a Weisner grab of 1·5 cub.m. (53 c.ft.) capacity—when coal has to be handled—as well as a hook (when the crane has to deal with coke skips or coke wagons). Lifting a maximum working load of 3200 kg. (3·14 tons), the crane has a working capacity of 12 tonnes of coal per hour when making an average travel of twice 35 m. The crane is electrically driven by three motors, one of 13 H.P. for a maximum lifting speed under full load of 10 m. (32·8 ft.) per minute, one of 22 H.P. for a travelling speed of 60 m. (196·8 ft.) per minute, and one of 6 H.P. to permit of slewing one complete revolution in sixty seconds.

The Glover-West retorts operating in the Brno Gas-Works are of the 40-in. "New Model," and are arranged in units of two. Each setting comprises eight retorts and two producers, so that one producer heats four retorts only. As already mentioned, the installation of twenty-four retorts has a total capacity of 46,500 cub.m. (1,642,100 c.ft.) per 24 hours. The retorts are approximately 7·6 m. (25 ft.) long, and are of elliptical cross-section, the axes of the ellipse at the top of the retort measuring 1015 mm. (40 in.) and 250 mm. (10 in.) respectively. Towards the base the retort swells out into a circular cross-section with a diameter of 1·5 m. (4·9 ft.). The retorts themselves and the combustion chambers are composed of silica segmental bricks, while the remainder of the settings, including the flues and passages for producer gas, secondary air, and waste gas are built up of bricks, blocks, and tiles of fireclay. The end walls of the settings are insulated partly with red bricks and partly with "Thermalite."

The base of each retort is fitted with a cast-iron coke chamber, the upper part of which houses a cast-iron coke extractor of the revolving helical-plane type. The lower part of each coke chamber is provided with a cast-iron door for discharging the coke, and each door is fitted with an eccentric-bolt locking device. The vertical shaft carrying the coke extractor is fitted at its lower end with a worm-wheel which engages with the driving-worm of a short horizontal shaft. One end of this latter shaft is fitted with a ratchet wheel and is arranged to be

driven intermittently from the reciprocating-rod system of the main driving gear which operates twelve retorts at once. The speed of operation of each individual extractor can be regulated according to demand, and, in case of necessity, each individual extractor can be switched out of operation altogether. The power for the main extractor-driving gear is given by two electric motors, each of 4 h.p., one of which is always in operation while the other acts as reserve.

The upper end of each retort is provided with a cast-iron mouthpiece. This mouthpiece is fitted with an ascension pipe for conducting the foul gas into the collecting mains, and also with a coal-feed hopper having a volumetric capacity of 3 hours supply of coal to the retort. The coal feed hoppers are arranged for filling from the overhead coal storage bunkers, and each is fitted at the top with an air-tight coal valve. The junction between each ascension pipe and the respective collecting main takes the form of a special gas valve, so that each retort can be shut down at will. Furthermore, each ascension pipe is fitted with a door to permit inspection and cleaning. The cast-iron top-mouthpiece of the retort is pierced by two further openings, one of which is used for filling the retort with coke after scurfing, and for rodding the charge in the retort. Normally the opening in question is kept covered by a lid and ball. The second opening is also provided with a ball-cover, and is used for inspecting and rodding the charge.

The process of operation for the production of town gas in the new installation is as follows:

The coal is discharged from the railway wagons into the coal-receiving hopper by means of the coal grab suspended from the crane. Alternatively the crane transports the superfluous coal to the coal store. The coal-receiving hopper is arranged beneath the lines of the railway siding in the immediate neighbourhood of the retort house, so that coal can also be discharged from the wagons into the receiving hopper by hand, if the crane happens to be busy transporting coke at the moment, or is occupied in unloading coal to store following the arrival of an unusually large train of coal-wagons. The coal-breaker pit is constructed of reinforced concrete and is arranged for the later addition of a wagon tipper. The pit measures 5 m. (16·4 ft.) in length, 6 m. (19·7 ft.) in breadth, and is 7 m. (23 ft.) deep. The cone-shaped coal-receiving hopper arranged in the upper part of the coal-breaker pit is composed of steel plates, 6 mm. thick, suitably stiffened and braced by channels and angles. The hopper holds approximately 20 tonnes of coal, and its sides are inclined at an angle of 45°, so that the coal flows by gravity through the bottom opening into the coal-feeder gear. The latter mechanism regulates the feed of coal to the coal breaker, which is arranged on the first floor of the coal-breaker pit, and the feeder is driven through a reduction gear by means of a belt from the breaker-shaft. The coal breaker consists essentially of the breaking-plate and toothed roller, which are of cast steel.

The breaker is driven by an 18-h.p. electric motor and reduces the run-of-mine coal to pieces not exceeding 50 mm. (2 in.) cube. The broken coal passes into a steel chute which leads it 2 m. deeper into the boot of a fixed-bucket elevator.

The elevator comprises a forged-steel chain carrying steel-plate buckets 50 cm. (20 in.) wide, the whole running in an enclosed housing of structural steel. The elevator and the coal breaker have each a capacity of 36 tonnes of coal per hour, the elevator being driven by a 12-h.p. electric motor. Raised through a height of approximately 24 m. (79 ft.) by the elevator, the broken coal passes through a chute into the hopper of an Avery automatic weighing machine. When the weighing hopper has received 400 kg. (880 lbs.) of coal, it sinks through a few inches, and a lever automatically shuts off the coal feed. At the same time a swing-door, which forms the floor of the weighing hopper, is automatically opened, and the hopper emptied. As soon as the contents of the weighing hopper have been discharged the hopper rises to its original position, the swing-door is closed, and the coal feed is turned on again. The number of masses of coal weighed in this way is registered by a counter. From the weighing machine the coal passes into a small hopper from which it is fed by gravity into the buckets of the conveyor for further transport and distribution to the compartments of the coal bunkers above the retort bench.

The conveyor consists primarily of two endless parallel chains, the individual links of which are connected together by means of bushes and trunnions. Small roller wheels, which are fitted to the bushes and trunnions, permit of a very smooth travel of the conveyor along the tracks and guides. The trunnions also carry the conveyor buckets. Each bucket holds approximately 30 to 35 kg. (66 to 77 lbs.) of coal, and has the approximate dimensions: 560 by 400 by 240 mm. (22 by 18 by 9·5 in.). In the horizontal direction the conveyor forms a continuous unbroken surface, so that the pieces of coal and coke discharged on to it cannot fall between the buckets. The conveyor encircles the whole retort house inside and is extended outside in the form of a loop to the coke-screening plant above the railway siding. In this way the coke discharged from the retorts can be conveyed direct to the screening plant. The conveyor has a capacity of 40 tonnes of broken coal per hour and is driven by means of a 12-h.p. electric motor. The special arrangement of the conveyor permits of the simultaneous handling of coal and coke.

The coal storage bunkers have a capacity equivalent to 48 hours' supply of coal to the retorts and are built of steel plates stiffened with angle and tee-irons. They are well supported on plate girders and suitable columns of rolled-steel joists. The bunkers are divided into six compartments, so that one compartment feeds four retorts. The outlets in the lower parts of the bunkers, through which the coal passes into the coal feeding hoppers above the retorts, can be closed by means of slides.

By opening the coal valve, which is provided above each coal feeding hopper, once every hour, coal is allowed to flow from the outlet of the bunker into the coal feeding hopper, whence it sinks into the retort at a rate which is governed by the speed of operation of the coke extractor at the base of the retort. For the coal to pass completely through the retort requires approximately 12 hours, which is ample time for complete carbonization. The coke is rendered cold at the bottom of the retort by means of injected steam, and the coke is then discharged mechanically into the coke chamber by means of the helical-plane extractor. From the coke chamber the coke is discharged every two hours by being allowed to flow into loose skips on four-wheeled carriages when the coke is to be delivered to the storage-heap, or into a travelling chute leading to the lip-bucket conveyor when the coke is to be conveyed to the screening plant or to the producer feed hopper.

The four-sided coke skips are provided with trunnions on two of the sides, by means of which they are suspended in a yoke from the crane hook and transported to the coke store. The skips are designed so that the centre of gravity of the coke-filled skip is higher than the trunnions and that of the empty skip lower than the trunnions. When the crane driver in the crane cabin withdraws the yoke-lock, therefore, the loaded skip turns over, discharges its load, and then returns to the original position. The travelling coke chutes have a rectangular opening in the lower part, so that the coke discharged from the retorts can be guided direct into the buckets of the bottom strand of the lip-bucket conveyor beneath the floor level. The openings in the travelling chutes are also fitted with trap-doors, so that the chutes can be used as skips for transporting coke to the store in case of necessity.

The foul coal gas and other products of carbonization pass off from the top of the retort through the ascension pipe into the collecting main. Although one collecting main is provided to every four retorts, the end of the ascension pipes have no "dip-seal." The tar and the ammoniacal liquor which condense in the collecting mains are allowed to flow off once every 24 hours into a tar and liquor tank arranged specially in the retort house for this purpose. The collecting mains and foul mains are flushed once per day by allowing ammoniacal liquor to circulate through them for one hour. From the collecting mains the foul gas is conducted away through foul mains and is led through a retort-house governor of the Parkinson and Cowan type, which reduces and regulates the pull of the exhauster, so that the tops of the retorts are actually under a very small pressure. At the exit from the retort house the foul mains have a diameter of 600 mm. (24 in.), but outside this is increased to 700 mm. (27·5 in.) to allow for joining up with future installations. The outside foul main is supported on trestles at a height of 5 to 6 m. (16 to 20 ft.) above the floor level, and leads to the condensers 120 m. (393 ft.) distant from the retort house.

(To be concluded.)

Nineteen Bradford Corporation Gas Department employees were presented, on April 4, by Alderman George Walker (Chairman of the Gas Committee), with First-Aid Certificates, secured as result of St. John Ambulance class training begun for the Department.

At the annual meeting of ratepayers at Cowling, Yorkshire, the Chairman of the District Council reported on proposals made by the Electrical Distribution of Yorkshire, Ltd., for street lighting by electricity, but investigations had shown that the cost would be almost double that of the present gas lighting.

The action of the Blyth Lighting and Water Committee in setting up a Sub-Committee to consider and report on the advisability and practicability of taking steps to acquire the Blyth Gas Undertaking, and to engage, if thought necessary, the services of an expert adviser, is causing much controversy. The amount estimated to purchase the Blyth Gas Company (which supplies both the Blyth and Bedlington districts) outright is at least £150,000. The town's rateable value is £146,095. The Company has always paid good dividends during its 70 years' existence, and is in every way an up-to-date concern. The present shareholders are not at all anxious to sell out, but if the proper price is paid there will be little difficulty.

Reconditioning of Gas Appliances.

By C. D. Blackhall, of the Edinburgh Corporation Gas Department.

Scottish Junior Gas Association (Eastern District), April 5.

I submit to you my observations on the repairing and reconditioning of gas appliances as is carried out in the Edinburgh Corporation Gas Department Workshops.

There are three standard free-loan sizes of cooker—viz., Edinburgh 1, 2, and 3, which are being fitted with "efficiency" types of hotplates. The fitting of these hotplates and the cleaning and overhauling of cookers is done at the same time. As old-pattern cookers come in from the various districts, they are stripped of their cornices, and the right-hand bridges which hold the tap rails are taken off, prior to being placed in a large gas oven for burning off the grease, &c. This oven holds about 16 to 18 cookers; hotplates, grillers, and boiling rings can be placed on the tops of the cookers. The oven is fitted with atmospheric burners and consumes about 600 c.ft. of gas per hour. The appliances are left in the oven for five or six hours.

Prior to burning off, all screws on the cookers are slackened off. After burning off, the cookers are then taken to the sand-blast plant, where they are scoured. On the completion of this operation, they are carefully examined, and cast-iron sections and new enamel linings fitted where required. The slag wool packing is examined and replaced if necessary. The cast-iron crown plates, external and internal, are taken off, and all foreign matter removed from them, either by sand-blasting or by the help of wire brushes. The cookers are then turned upside down and the oven jet rails taken out and injectors re-leaded and tested before re-fitting. The re-assembling of the cookers now takes place, and new oven extension rods are fitted. A new right-hand bridge is fitted, making both bridges interchangeable. The same cornice is used for the "efficiency" hotplate. A jig is fixed on the cornice, and six holes are drilled and countersunk for screws to hold the efficiency cock rail and burner carriers.

These cock rails are tested by air pressure under water, to ensure absolute "efficiency." A ½-in. iron supply pipe, with teepiece, plug, and brass coupling cap is fitted into the "efficiency" cock rail. This supply pipe can be fitted on either side of the cooker, as the cock rail is drilled and tapped for such an arrangement. The cock rails are also drilled ¼ in. iron and plugged in readiness for fitting a connection for a gas iron, at the opposite end to the oven stopcock, thus giving the undoubted advantage of all stopcocks being in the front of the cookers. The burners are next placed in position, together with the new pattern cornice bars, and the cookers are then passed to the painters for their attention. The paint used is black cooker enamel, and the cookers are painted by flat brushes ½ in. by 2½ in. Special gloves are supplied to the painters during this operation. The enamel linings are cleaned, and the cooker is next passed to the testing bench for burning off and regulating purposes.

All burners, cornice bars, &c., are packed into the oven of the cooker, together with a new grill pan and grid, enamel crown-plate, and drip pan. The oven door is then tied, and the cooker placed ready for sending out. An asbestos plate suitable to the size of the cooker required is issued also. The number of cookers of the Edinburgh types issued last year amounted to over 4000. Plate racks and trays adaptable to the three sizes can be supplied, but are charged as extras. The Edinburgh cookers are, of course, free-loan appliances, and their badge numbers are noted for office use when issued.

Instruction cards are issued with all appliances, such as cookers, radiators, fires, &c., so that consumers have first-hand knowledge how to use the apparatus to obtain the best results.

Radiators of all makes and types are repaired and overhauled in the workshops also. They are sand-blasted and tested before painting. If the sections are not tight, the steel push nipples which connect each section are replaced by new ones. The push nipples are sometimes burnt out through the lack of water. In Edinburgh, two inspections of all fires, radiators, &c., in all districts are made during the winter season, thus eliminating many complaints, besides keeping the appliances in good order. The flanges on the radiator are next thoroughly cleaned before the fitting of the gas and water ends. A rubber washer is fitted with each flange, and a diaphragm for "shutting-down" purposes is fitted along with the gas end. Water is next added, the quantity varying from 1 quart to 3 or more

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quarts, according to the size of the radiator in question. The burner is then fitted and the radiator tested. The air valve is left open until the radiator steams and is then closed, and observation is kept to see that the diaphragm is acting before sending out to the districts. Occasionally a radiator gets air-locked, but if the small screw at the top of radiator is released and the radiator allowed to "blow," this will eliminate the trouble. All screws used on radiators are, of course, made of brass. About 150 radiators are sent out annually.

Fires returned to the workshops from hire are dismantled, and the burners thoroughly cleaned. The bricks are examined and touched up with distemper, while the frame of the fire itself is re-painted if necessary. It is then re-assembled and placed ready for issue. Pendants are altered to the consumer's requirements by the brassfinisher, who also repairs gas irons, instantaneous water-heaters, pressure gauges, blow lamps, &c. Stopcocks of all appliances are also ground-in and put in first-class condition, while brass diminishers and various brass connections are speedily turned out on the lathes.

The tinsmiths make backplates, boxplates, flue pipes, canopies, deflecting bricks, and do various other jobs, such as making resin and grease boxes, fillers, &c., all to sketches supplied by the district inspectors. Minor repairs are also carried out on meters, while wash-boilers are repaired and re-tinned.

Geysers of all types are repaired in the workshops. This is rather an interesting operation. Great care is taken to see that each geyser is absolutely tight, and also examined to ascertain that the by-pass and burner are in good working order before assembling. Each geyser is tested, and a looking glass used to observe conditions when the geyser is lit. Condensation sometimes gives the impression that the geyser is leaking; but if the amount of water collected is not more than an ordinary cupful after an hour's test, it can be taken that the apparatus is functioning properly. In fitting geysers, it is always instructive and beneficial to the consumers to allow them to operate the geysers under the tuition of the gasfitters or plumbers. This obviates complaints and accidents. The consumer's attention should always be drawn to the instructions on the geysers.

The plant in the workshops in Edinburgh consists of two gas engines, air compressor, sand-blast plant, drilling machine, two screwing machines, a mechanical saw, a high-speed buff and dolly for polishing, two gas ovens, a paint spraying plant for fires, and a large tank for washing tins, &c. It will thus be seen that everything for making a good job is at hand.

Discussion.

The President (Mr. J. Scobie, Dunfermline) asked what was the temperature of the gas oven for burning-off purposes.

Mr. Blackhall replied that it was 600° Fahr.

Mr. T. M. Duncan (Perth): Is the gas iron connection a maker's idea?

Mr. Blackhall: No; it has been evolved by the Edinburgh Gas Department.

Mr. David Yule (Alloa): Are the 4000 cookers sent out in one year new or reconditioned?

Mr. Blackhall: They are Edinburgh cookers fitted with "efficiency" cock rails.

Mr. Yule: In regard to the leaking of radiators, have you experienced any trouble after fitting new nipples?

Mr. Blackhall: No; the steel push nipples must, of course, be driven home, and fixed properly in position.

Mr. Storrier (Dundee): Do you approve of the practice of consumers altering the regulators of burners?

Mr. Blackhall: No.

The President said he agreed with the policy of the Edinburgh Gas Department in popularizing gas appliances by issuing instruction cards.

Mr. Cameron (Dundee): Does the modernizing of the Edinburgh cookers imply that only three standard patterns are now available for loan purposes?

Mr. Blackhall: All other types of cooker are being scrapped up to the size of the Edinburgh No. 2.

Mr. David Vass (Engineer and Manager, Perth) referred to the examination of appliances *in situ*, and asked what kind of asbestos plate was issued for cookers.

Mr. Blackhall replied that the inspection of appliances was carried out by specially selected men who were instructed in the workshops and then passed out to the districts. The asbestos plate used was really "Poilite"—not real asbestos, but a composition of asbestos cement.

Explosion at Walsall.—An explosion, which injured three workmen, occurred at Walsall on Friday last, during the laying of a new enlarged gas main. Until an official inquiry has been made it will not be known how the explosion really occurred.

Tenders for Slough Stock Issue.—The tenders for the £30,000 ordinary stock which were offered for the Directors of the Slough Gas and Coke Company were opened on April 14, and ranged from £108 per £100 down to the minimum of par. The total amount applied for was £68,977, and the average price obtained was £105 4s. 5d. p.ct. The 5 p.ct. perpetual debenture stock was also over-subscribed at from £99 down to the minimum of £97 10s. per £100.

Parliamentary Intelligence.

[From Our Special Correspondents.]

House of Lords.

Special Orders.

The Bideford and Oxford Gas Orders, having been passed by the Special Orders Committee, have been approved by the House.

Private Bills.

The South Staffordshire Mond Gas Bill has received the Royal Assent.

The Brighton and Hove Gas Bill has been read a first time and referred to the Examiners.

A petition from the Hartlepool Gas and Water Company for leave to introduce a Bill has been read, and referred to the Examiners.

House of Commons.

Special Orders.

The Bideford and Oxford Gas Orders have been approved by the House.

Plans have been deposited in connection with the Dudley, Brierley Hill, and District Gas Order.

Private Bills.

The Brighton and Hove Gas Bill has passed its third reading and been sent to the House of Lords.

The petition of the Coatbridge Gas Company against the Glasgow Corporation Bill has been withdrawn.

A petition from the Hartlepool Gas and Water Company for leave to introduce a Bill has been referred to the Examiners.

Australian Gas Light Company.

Chairman's Address.

In moving the adoption of the report and accounts of the Australian Gas Light Company for the half-year ended Dec. 31 last, the Chairman (Mr. George J. Cohen) said:

As mentioned to you at the annual meeting of the Company in August last, the qualities of the coals procurable have been such, that despite the use of all the available manufacturing plant, sufficient gas to satisfy the demands of consumers could not, on occasions, be produced. These occasions were fortunately few in number during the past half-year. During the month of August additional carburetted water gas plants, the erection of which had been rushed to completion, were commissioned, and have since proved themselves to be of great value in maintaining the city's supply of gas in the face of a continued deficiency in both the quantity and quality of the coals available.

The gross cost of the gas made during the half-year exceeded the cost for the corresponding half of the previous year by £52,431. Revenue from the sale of residuals increased by £22,335, resulting in an increase in the net cost of the gas made of £30,096. It must, however, be pointed out that the whole of the increased cost of coal is not reflected in these figures. The Gas Act provides that the special purposes fund, which at June 30, 1929, amounted to £197,093, shall be applicable to meet, among other charges, "expenses incurred by reason of circumstances which due care and management could not have prevented, or by reason of strikes," and your Directors have drawn upon that fund to the extent of £114,151 to meet the increased prices paid for coal during the past half-year. Out of the net profits, which amount to £295,347, your Directors have set aside £134,000 as a contribution to the special purposes and depreciation fund, leaving £161,347 available for the payment of a dividend. The payment of a dividend of 4 p.ct. for the half-year, as recommended, will absorb £164,400, which will reduce the balance to be carried forward from £35,293 to £32,240.

Against the increases in cost which have been experienced during the past half-year, it is pleasing to report that the revenue from the sale of residuals has improved to the extent of £22,335. The revenue from the sale of tar has increased mainly owing to its increased popularity as a fuel for steam-raising purposes. Its use for road-making purposes has likewise increased to the extent of 17·5 p.ct., and the recent placing on the market by the Company of new tar products, possessing qualities which render them specially suitable for road work, should make for the more profitable use of tar and should help to stem the tide of imported road-making materials. The revenue from the sale of coke likewise shows a satisfactory increase. The revenue from the sale of sulphate of ammonia has, however, considerably decreased, the result partly of a smaller production because of the inferior quality of coal used, and partly of a decrease in the world's parity price.

It is also pleasing to report that the use of gas for industrial purposes is rapidly increasing, being now 7 p.ct. of the total gas sold. The quantity so used during the past half-year was 269 million c.ft., which represents an increase of 31 p.ct. over the quantity used during the corresponding half of the previous year. The number of consumers supplied with gas during the half-year increased by 4 p.ct., being now 250,905, and the quantity of gas sold increased by 5 p.ct., being now 3,831,924,000 c.ft.

I now have pleasure in moving: "That the statement of the Directors, now read, be received and adopted, and that this meeting do order and determine that a dividend for the half-year ended Dec. 31, 1929, be paid at the rate recommended therein—viz., 4 p.ct."

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Apl. 11.	Rise or Fall on Week.	Transactions Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 6	5	5	Aldershot 5 p.c. max. C. .	73–78	..	..
532,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	70–73	..	..
1,551,868	,,	Apl. 3	7⅜	7⅜	Alliance & Dublin Ord. . .	92–95*	+2	92½–94⅛
374,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb. . . .	60–63	..	..
522,655	,,	Mar. 6	7	7	Barnet Ord. 7 p.c.	109–112	..	..
300,000	1	Oct. 24	1/4½	1/4½	Bombay, Ltd.	16/- -18/-	..	16/6–16/9
174,500	10	Mar. 6	9	9	Bournemouth 5 p.c. . . .	13½–14½	+⅛	14–14¼
500,050	10	,,	7	7	Do. B 7 p.c. . .	12½–12⅞	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c. .	10⅞–11½	..	..
50,000	Stk.	Dec. 19	3	3	Do. 3 p.c. Deb. .	55–58	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb. .	74–77	..	
357,900	,,	Mar. 20	7½	7½	Brighton & Hove 6 p.c. Con.	113–116	..	..
871,880	,,	,,	6¾	6¾	Do. 5 p.c. Con.	100–103	..	..
1,287,500	,,	Feb. 20	5	5	Bristol 5 p.c. max.	87½–88½*a*	..	..
855,000	,,	Apl. 3	7	8	British Ord.	110–115	..	111½
100,000	,,	Dec 19	7	7	Do. 7 p.c. Pref. . . .	115–120	+6	117
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	69–71	..	..
450 000	,,	,,	5	5	Do. 5 p c. Red. Deb. .	92–95	..	..
100.000	,,	Jan. 9	5	5	Cambridge 5 p.c. Deb. .	90–93	..	..
100,000	10	Dec 5	8	6	Cape Town, Ltd	8½–9½	..	..
100.000	10	Nov. 7	4½	4½	Do. 4½ p.c. Pref. . .	6½–7½	..	..
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb. . .	69–74	..	..
626,860	,,	Feb. 20	6	6	Cardiff Con. Ord.	96–99	..	96¼
237,860	,,	Jan. 9	7½	7½	Do. 7½ p.c. Red. Deb. .	98–101	..	..
157,150	,,	Feb. 20	5	6½	Chester 5 p.c. Ord.	87½–92½*b*	..	..
98,936	1	Oct. 10	†2/-	†2/-	Colombo, Ltd. Ord. . . .	34/—36/-	..	..
24,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. .	19/—21/-	..	..
375,402	1	Apl. 3	1/9⅜	1/9⅜	Colonial Gas Assn. Ld. Ord	20/—22/-*	..	..
187,848	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	19/—21/-*	..	..
2,073,280	Stk.	Feb. 20	5	7	Commercial Ord.	89–92	+1	88½–91
475,000	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	57–60	..	..
787,560	,,	Feb. 20	7	7	Croydon sliding scale. . .	104–107	..	105
453,100	,,	,,	5	5	Do. max. div.	83–86	..	84–85
542.270	,,	Mar. 6	7	10	Derby Con.	1 5—125*e*	..	..
55,000	,,	Dec. 19	4	4	Do. Deb.	67–70*e*	..	..
209,000	,,	Mar. 6	5	5	East Hull Ord. 5 p.c. . . .	71–73	..	..
1,902,180	10	Mar. 20	†4	†7	European, Ltd.	14½–15½*	..	14⅞–15½
18,629,125	Stk.	Feb. 20	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	18/9—19/3*f*	—/3	18/9–19/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max. . . .	62½–64½	..	..
4,157,020	,,	,,	4	4	Do. 4 p.c. Con. Pref. . .	77–80	..	77–78
5,602,620	,,	Dec. 19	3	3	Do. 3 p.c. Con. Deb. . .	58–61	..	..
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. . .	98–101	..	..
82,500	,,	Mar. 20	7	7	Hastings & St. L. 5 p.c. Conv.	96–101	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	78–83	..	81
70,000	10	Oct. 10	†10	†10	Hongkong & China, Ltd. .	13½–14⅞	..	..
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 3½ p.c. . . .	90–93	..	..
1,976,000	,,	Nov. 1	20	10	Imperial Continental Cap. .	390–410	+5	385–402
223,130	,,	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb.	75–85	..	85
235,242	,,	Mar. 20	8½	8½	Lea Bridge 5 p.c. Ord. . .	112–115	..	..
2,145,907	,,	Feb. 20	6	6	Liverpool 5 p.c. Ord. . . .	89½–90½*b*	..	..
600.000	,,	Mar. 20	7	7	Do. 7 p.c. Red. Pref. .	99–101*b*	..	..
165,736	,,	Feb. 20	9	8	Maidstone 5 p.c. Cap. . .	119–124	..	..
63,480	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	52–55	..	..
75,000	5	Dec. 5	†10	†10	Malta & Mediterranean . . Metrop'itan (of Melbourne)	5½–6	..	..
392,000	—	Apl. 1	5½	5½	5½ p.c. Red. Deb. . . .	90–93*	..	..
541,920	Stk.	Nov. 21	†9	†6	Montevideo, Ltd.	107–112	..	110½–111
2,061,315	,,	Feb. 20	5	5½	Newcastle & Gateshead Con.	15/6—16/3*d*†	..	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref. .	70–71*d*	..	..
691,705	,,	Dec. 19	3½	3½	Do. 3½ p.c. Deb. .	66½–67½*d*	..	..
169,940	,,	Mar. 6	7½	7½	North Middlesex 6 p.c. Con.	109–114	..	..
396,160	,,	Feb. 6	5	5	Northampton 5 p.c. max. .	74–77	..	..
300,000	,,	Nov. 21	7	9	Oriental, Ltd.	108–113	..	..
60,000	5	13 My., '15	—	—	Ottoman	0—¼	..	..
205,162	Stk.	Jan. 9	8	8	Plym'th & Stonehouse 5 p.c.	107–110	..	..
424,416	,,	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Std	110–115	..	..
241,446	,,	,,	5	5	Do. 5 p.c. max. . .	78–81	..	..
2,384,464	1	June 27	—	15	Primitiva Ord.	28/—30/-	..	28/6
244,500	100	Dec. 2	4	4	Do. 4 p.c. Red. Deb. . .	92–95	..	..
695,000	Stk.	Jan. 23	4	4	Do. 4 p.c. Red. Deb. 1911	81–84	..	..
416,345	,,	Dec. 19	4	4	Do. 4 p.c. Cons. Deb. .	81–84	..	..
150,000	10	Apl. 3	6	6	San Paulo 6 p.c. Pref. . .	8½–9*	..	..
1,736,968	Stk.	Mar. 20	6½	6½	Sheffield Cons.	102–104*e*	..	..
95,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb.	76–78*e*	..	..
90.000	10	June 13	‡4	‡4	South African	4–6	..	..
6,709.895	Stk.	Feb. 20	5	7½	South Met. Ord.	100–103	+1	100–102½
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	107–110	..	108½–109½
1,895.445	,,	Jan. 9	3	3	Do. 3 p.c. Deb. . .	58–61	..	59½–60¾
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Db.	98–100	+1	100
91,500	,,	Mar. 20	8½	8½	South Shields Con. . . .	105½–107½*d*	..	..
1,543,795	,,	Feb. 20	6½	6½	South Suburban Ord. 5 p.c.	98–101	..	..
468,837	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92–95	..	..
647,740	,,	Feb. 20	5	5	Southampton Ord. 5 p.c. max.	76–79	..	..
121,275	,,	Dec. 19	4	4	Do. 4 p.c. Deb.	72–75	..	..
179,014	,,	Feb. 20	8	8	Sutton Ord.	113–116	..	..
67,828	,,	Jan. 9	5	5	Do. 5 p.c. Deb. . . .	91–94	..	..
250,000	,,	Mar. 6	7	7	Swansea 7 p.c. Red. Pref. .	98–100	..	..
200,000	,,	Dec. 19	6½	6½	Do. 6½ p.c. Red. Deb. .	99–101	..	..
1,076,490	,,	Mar. 6	6⅝	6⅝	Tottenham District Ord. .	101–105	+1	103–104
150,000	,,	,,	5⅝	5⅝	Do. 5⅝ p.c. Pref. . .	95–98	..	..
199,005	,,	Dec. 5	4	4	Do. 4 p.c. Deb. . .	70–73	..	..
182,380	10	30 Dec., '12	—	—	Tuscan, Ltd.	3½–4½	..	..
85,701	Stk.	Mar. 20	6	6	Do. 6 p.c. Red. Deb.	75–80	..	..
309,094	,,	Mar. 6	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	94–99	..	..
88,336	,,	,,	5	5	Do. 5 p.c. pref. . .	85–90	..	90
1,180,970	,,	—	—	—	Wandsworth, Wimbledon, and Epsom Cons. . .	107–112	..	..
200,000	,,	Feb. 20	5	5	Do. 5 p.c. Pref.	85–90	..	..
488,344	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92–97	.	96

Quotations at:—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. *f*.—The quotation is per £1 of Stock. * Ex. div. † Paid free of income-tax. ‡ For year.

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Town Hall,
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(GAS DEPARTMENT.)

RETORT SETTING.

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Drawing and specification may be obtained on application to Mr. N. B. Thompson, Engineer and Manager, Gas-Works, Cavendish Street, Skipton.
Sealed tenders, endorsed "Retort Setting," to be addressed to Mr. J. P. Horne, Clerk to the Council, Town Hall, Skipton, and to be delivered not later than Wednesday, the 30th of April, 1930.
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Clerk to the Council.
April 11, 1930.

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PONTYPRIDD URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

TENDERS are invited for the Supply and Delivery of STEEL MAINS and SPECIALS.
Full particulars may be obtained from Mr. David Muir, Engineer and Manager, Gas-Works, Treforest.
Sealed Tenders, endorsed "Steel Mains," to be received by the undersigned not later than the 26th of April, 1930.
The Council do not bind themselves to accept the lowest or any Tender.
H. LEONARD PORCHER,
Clerk of the Council.
Municipal Buildings,
Pontypridd,
April 11, 1930.

COUNTY BOROUGH OF BURNLEY.
(GAS DEPARTMENT.)

THE Corporation are prepared to receive TENDERS for the Supply and Erection of about 39 Tons of STRUCTURAL STEELWORK in the Extension of the OXIDE REVIVIFYING SHED at the Oswald Street Works.
Drawings, Specification, and Form of Tender may be obtained on application to Mr. J. Herbert Clegg, A.M.I.Mech.E., F.C.S., Gas Engineer and Manager, Gas Offices, Parker Lane, Burnley.
Sealed Tenders, appropriately endorsed and addressed to the Chairman of the Gas Committee, to be delivered at the Gas Offices, Parker Lane, Burnley, on or before the 22nd of April, 1930.
The Corporation do not bind themselves to accept the lowest or any Tender.
By order,
COLIN CAMPBELL,
Town Clerk.
Town Hall,
Burnley,
April 14, 1930.

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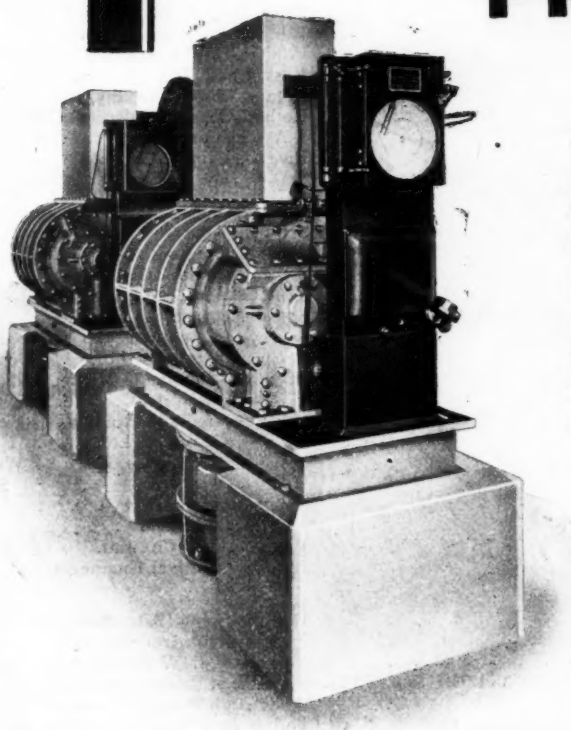

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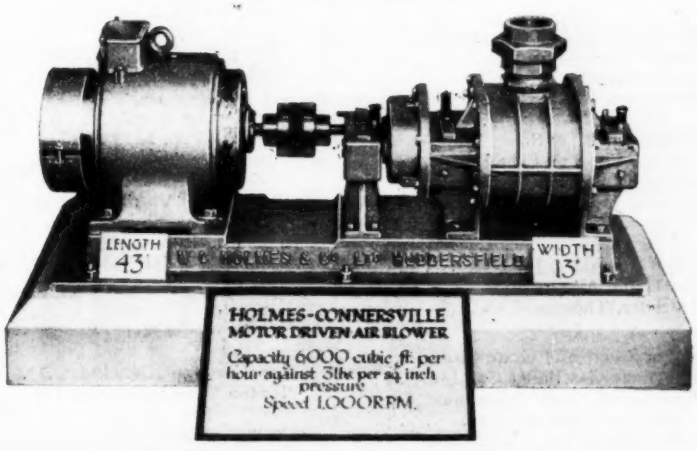

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